DOCUMENT RESUME

ED 034 856 VT 009 813

TITLE Papers Presented at the National Conference on Methods and Strategies for State Plan Development in Accordance with the Provisions of the Vocational Education Amendments of 1968 (March 24-27,1969, Covington, Ky.).

SPONS AGENCY Office of Education (DHEW), Washington, D.C.

PUB DATE 69

NOTE 159p.

EDRS PRICE EDRS Price MF-$0.75 HC-$8.05

DESCRIPTORS Advisory Committees, *Conference Reports, Educational Planning, Federal State Relationship, *Master Plans, Program Development, Program Evaluation, *Program Planning, *State Programs, State School District Relationship, State Standards, Systems Approach, *Vocational Education

IDENTIFIERS Public Law 90 576, *Vocational Education Amendments of 1968

ABSTRACT

The six papers are: (1) "Vocational Education Program Planning at the State Level," by Walter M. Arnold, Director, Pennsylvania Vocational Education Study, (2) "A Systems Approach to Vocational-Technical Education Planning at the Local Level," by Cleveland L. Dennard, President, Washington Technical Institute, (3) "The Role of Professional Vocational Education Personnel in State Program Planning and Evaluation," by William G. Loomis, Assistant Superintendent, Division of Community Colleges and Vocational Education, Oregon State Board of Education, (4) "State Advisory Councils for Vocational Education," by Rupert N. Evans, University of Illinois, (5) "Methodologies for Conducting State Program Evaluation," by Harold Starr, The Center for Vocational and Technical Education, The Ohio State University, and (6) "Summary Paper," presented by a representative of the Bureau of Vocational Education, Kentucky State Department of Education. (DM)

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ED034856

PAPERS

Presented at the

NATIONAL CONFERENCE

METHODS AND STRATEGIES FOR STATE PLAN DEVELOPMENT IN ACCORDANCE WITH THE PROVISIONS OF THE VOCATIONAL EDUCATION AMENDMENTS OF 1968

March 24 - 27, 1969

President Motor Inn

Covington, Kentucky

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PAPER NO. 1

VOCATIONAL EDUCATION PROGRAM PLANNING AT THE STATE LEVEL

Prepared by
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NATIONAL CONFERENCE

Methods and Strategies for State Plan Development
In Accordance with Provisions of the
Vocational Education Amendments of 1968

President Motor Inn
Covington, Kentucky
March 25, 26, and 27, 1969

VT009813

VOCATIONAL EDUCATION PLANNING AT THE STATE LEVEL

The new vocational education act, P.L. 90-576, if not very clear, is certainly detailed in specifying the requirements upon the States for State level annual and long range program planning. The required program planning is to be distinguished from the also required administrative plan which serves as the contractual agreement between the Federal Government and the State. This paper will deal chiefly with those requirements in Section 123(a)(4)(5) and (6), namely, the required long range program plan, the annual program plan, and certain policies and procedures related to the use of results of periodic evaluations and projected manpower needs. Prior to the presentation of a thorough discussion of a systematic procedure for program planning, it would be useful to identify certain basic factors that undergird the detailed planning requirements of the new act.

First, the new act makes it quite clear that the 'State Board' designated or created by State law is the sole State agency responsible for the administration of vocational education or for the supervision of the administration thereof by local educational agencies, in the State. Although this has always been so in Federal vocational education legislation, there is still considerable misunderstanding at least in some States as to its purpose and meaning. It seems apparent that the authors of the first Federal vocational education legislation in 1917 foresaw the many difficulties that could be encountered if the administration of the program was proliferated in the States. Over the years the many legal and policy decisions bearing on this matter, emphasized over and over again in many different ways, that the 'State Board' was expected to be, as some put it, the "catalytic agent" in the State responsible for leadership in promoting, planning, implementing and funding the programs in vocational education agencies and institutions.

There is evidence that the States have not always carried out such responsibilities in practice, or at least, certainly not in terms of so-called total unified program planning. These deficiencies explain in part why in a number of cases other boards were legally constituted by some States to administer some vocational and technical education programs. In a broader sense the States have never taken on the full responsibility that might have been conceived originally in coordinating all manpower training activities in a State whether Federally aided or not. In any case, one of the purposes of this presentation is to urge that this broader responsibility be taken on and to show how it might be

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A Paper -- Prepared and presented by Walter M. Arnold at the National Conference on Methods and Strategies for State Plan Development in Accordance with the Provisions of P.L. 90-576, March 26, 1969, President's Motor Lodge, Covington, Kentucky.

done.

Secondly, it does not seem possible to discuss or treat vocational education planning at the State level without dealing with the local educational agency responsibilities and activities in the process. In other words, vocational education program planning has to be a continuous interaction between the State and local levels in order for total planning to be properly unified and coordinated in the State. In this paper, the emphasis and attention will be given to the responsibilities and activities required at the State level and with minimal emphasis on the part to be played at the local level. Special attention will be given to local level planning in another presentation by Dr. Cleveland Dennard of Washington, D.C.

Third, it is also quite clear that the newly created National and State Advisory Councils take on a much more important mandated role than ever before. A cursory examination of the new act discloses that the rules and regulations, policies, planning procedures and evaluation are all to be developed in consultation with the advisory councils. In fact, the new law requires that the State Advisory Councils shall evaluate programs, the vocational education services and activities in each year. Special mention is made of evaluation at this point because evaluation becomes an inherent part of the planning procedure discussed in this presentation. However, evaluation will not be discussed in any detail here because it is the subject of another paper prepared by Dr. Harold Stahr of the Ohio State University Research Center. Likewise, the relationships between the State Advisory Council and the State Board will be discussed in a paper to be presented by Dr. Rupert Evans of the University of Illinois.

Finally, there are the considerations of State organization and administration, the role of State personnel, and financial aid policies at the State level all of the utmost importance in the implementation of program plans. It is obvious, that without consideration of these factors, the most sophisticated program plans would be of no avail. Emphasis will be given to the role of State personnel in planning and implementation in another presentation by Dr. William Loomis of Oregon.

Before presenting a planning procedure and its application, it seems worthwhile to review briefly the important specific requirements for planning in the new act. Perhaps this can be done by listing the requirements with some comment:

(1) Both annual and long range plans are to be set forth by the State. There seems to be no reason why the annual plan should not be an integral part of the long range plan which is to be projected for not less than three years and not more than five years ahead. Each subsequent year the new annual plan could be developed and the long range plan revised to add another year to the projection.

(2) All plans need to be developed in consultation with the State Advisory Council. This will require good communication and coordination with the State Board so as to avoid unnecessary duplication or possible conflict.

(3) The Plans must reveal that substantial progress will be made toward meeting the vocational education needs of potential students. This could hardly be guaranteed in advance. It will take evaluation results to establish progress.

(4) The plans must indicate how and to what extent the the contemplated annual program services and activities will carry out the program objectives set forth in the long range plan. This is why the two plans should be integral.

(5) The plans must indicate how, and to what extent the use of Federal funds will consider the eight purposes in Section 122 (a), namely programs for high school students, high school graduates and dropouts, adults who need training or retraining, the socioeconomic handicapped, the physically and mentally handicapped, construction of area schools, vocational guidance and counseling, for private school students, and ancillary services and activities.

(6) The plans must show due consideration to current and projected manpower needs with emphasis on new and emerging needs. Annual and long range projections can and should be tied together.

(7) The plans must show due consideration to the relative vocational education needs of all population groups in all geographic areas and communities. This is why the concept of total unified program planning is imperative.

(8) The plans must show due consideration to the relative vocational education needs of persons with academic, socioeconomic, mental and physical handicaps. This also relates to the great need for total unified program planning.

(9) The annual plans must describe the content of and allocation of Federal and State vocational education funds to programs, services and activities. This is why all feasible alternatives solutions need to be considered and programs finally selected on some priority basis.

(10) All other requirements of the plans have to do with funding policies that give due consideration to the local community's wealth and ability to finance a program. This matter will be dealt with only briefly in this paper. However, it is so urgent under requirements of the new act that a special paper on financial aid policies should be developed.

THE NEED FOR TOTAL UNIFIED PROGRAM PLANNING

Statewide program planning of Vocational and Technical Education programs has been at best somewhat haphazard and fragmentary. Apparently this is why the Congress insisted on the specificity of program planning in P.L. 90-576. For many years, vocational education programs were rather limited in terms of meeting the many different occupational training needs of the labor force. The continuing demands in some fields for many years were readily identified and accepted. Hence, new or expanding local programs generally established one or more of the common training offerings without so much as a local field study.

Many of the limitations in vocational education were caused by the lack of funds to plan, establish and operate programs beyond the several commonly known occupations. Except for general promotion of vocational education in the early years of the Federally aided program, local initiative largely determined the establishment of a program and the choice of occupational offerings. Very little program planning was initiated at the State level and then only after a local community expressed its desire to do something. Too often program planning consisted chiefly of looking at other programs and deciding to do likewise.

As the labor force has grown and diversified, and its needs have been more clearly identified; as the philosophy and practices of vocational education have broadened to take into account the growing demands in agriculture related jobs, gainful occupations involving home economics skills, technician jobs, health occupations, sales and service jobs of many different kinds and office jobs; as the Federal, State and local funds have been substantially increased particularly in the past five years; and as many other educational agencies and training programs have begun to play an increasingly important part in supplying trained manpower, two conclusions are inevitable:

(1) The State Boards for Vocational Education and the State Departments of Education should play a much more substantial important leadership role in State-wide program planning and

(2) There should be developed and adopted an organized, systematic planning procedure in which all educational and training agencies public and private can participate in the public interest.

Only in this way does it seem possible that public and private funds can be used most effectively and efficiently in meeting all of a State's manpower needs; that unnecessary overlapping and duplication of effort and expense can be eliminated; that all occupational training programs can be properly coordinated to the end that occupational training programs might not produce surpluses of trained persons in some fields and perhaps at the same time neglect critical occupational demands in other fields; and that occupational training will in fact prove to be an economic asset to the State and a community.

Occupational training programs of all kinds, public and private, are growing rapidly in all States, especially those in public education. The demand for funds to finance the construction and operation of new and expanding programs is increasing tremendously. Other educational institutions and training agencies are also seeking various forms of increasing public financial support. Therefore, it is essential that the State should examine all of the elements in occupational training and attempt to plan present and future developments in a total context.

There are several underlying important elements or factors that need to be identified in any effort to develop an effective total unified program plan of vocational and technical education:

(1) Sufficient attractive job opportunities upon completion of training are absolutely necessary to complete the cycle of basic education, career choice, and occupational education. Since job opportunities are dependent upon the economy, it is important that the competitive posture of the State be studied and analyzed to determine the socioeconomic status and trends in the State. This kind of study can stimulate and lead vocational educators to assist State and local industrial development leaders in attracting new potential growth industries into the State. In this way, it appears that vocational and technical education can, in fact, become an economic asset to the State. Obviously, it is important that there be available a trained labor force which is adaptable to the requirements of new industry through a responsive system of vocational and technical education facilities and programs.

(2) Closely following and directly related to socioeconomic analysis is the identification of current and projected trained manpower demand, State-wide and locally. Specifically, this would require that the State Board set up ways and means, perhaps through the resources of the State's Research Coordinating Unit and in cooperation with the State's Bureau of Employment Security, to obtain data on present and projected employment by detailed occupational classifications that will be useful in program planning. These data should be studied in relation to the annual and projected supply of trained manpower.

(3) The annual output or supply of trained graduates (and qualified early leavers) from all training agencies and institutions in the State is a most important input to the process of total unified program planning. Here again the resources of the State's Resource Coordinating Unit can be utilized to obtain this data.

(4) Analysis of the population and enrollment characteristics and trends in the State is also essential from the standpoint of the current and projected potential labor force and those persons' needs. Obtaining data and ways and means of analyzing them should be possible through the research bureau of State Departments of Education.

(5) In the same way that job opportunities are a key to the successful transition from school to work so are a wide range of physical facilities, equipment, teachers and the other resource requirements essential to the occupational education of the people who need it and can profit from it.

(6) It is essential that all types of existing and proposed schools, institutions and training mediums in the State be identified and their present and potential contributions be considered when total unified program planning is undertaken.

With these several elements in mind this paper presents a systems approach and an application to State/local vocational and technical education program planning. The purpose of this presentation is not to "sell" the theory of the formal systems cycle or the systems approach as such. It is rather to develop a practical systematic procedure to attack the problem of total unified program planning at the State level.

Any effective systematic planning requires continuous updating of not only the input data but of the system itself. Application of a flexible systems approach should in itself contribute to continuous review, adaptation, revision, and refinement to assure that the system is serving the necessary purposes of P.L. 90-576 effectively and efficiently.

The planning procedure described herein is comprehensive and detailed. It is not a simple formulized method that can be used as a panacea for all program planning ills. It requires serious sustained thinking. It does not make or provide decisions. The procedure should be studied carefully and thoroughly so that its application may make the maximum contribution to decision-making in selecting, establishing and operating the many needed new and expanded programs. The ultimate goal, in harmony with the basic purpose of P.L. 90-576, is to assure the best use of funds in the light of the urgent needs of all the people of the State as well as those of the employers of the State.

The "Systems Approach" to State-Local Vocational Education Planning

The planning procedure described in this section is based on an organized process of decision-making and program formulation known as the "systems approach". This planning process is primarily a deductive process in which all work is organized in a series of planning and decision-making steps. Also all of the steps, including the decision structure, are clearly documented so that (1) the planning process can be reviewed, (2) alternative approaches can be considered and compared with the prepared plan, and (3) the effect of changing conditions and decisions criteria on the plan can be studied. The planning system described here is therefore designed to be applied as a continuous process -- a way of conducting a complex business with greater emphasis on logical decision-making.

In explanation of the "systems approach", the central philosophy is often obscured by discussions of complex diagrams which illustrate only a portion of the features of the approach. In essence, the "systems approach" is a point-of-view which can be described by contrasting it to a common and opposite approach to planning. This opposite approach may be designated as the "inductive" approach, since inductive type of thinking is dominant in its application. In this approach, facts, data, opinions, requirements, etc. are gathered and organized into a report or plan. The objectives serve principally as a guide to the organization of the plan. This planning approach is usually a one step process, and is suitable when the problem is simple enough that it can be understood in all of its ramifications by one man (with assistance from others in the data collection aspects of the planning process). The "inductive approach" is also applicable to problems in which the facts, data, opinions and requirements, i.e., the environment of the problem, is not expected to change in an unpredictable way with the passage of time. In other words, it applied to relatively simple, static problems. However, when this approach is applied to complex, dynamic problems, it is usually found that the resulting report or plan covers only a few aspects of the total problem, and that, due to changing conditions, it is obsolete soon after it is published.

Since, as previously described in this section, the vocational and technical education planning situation is indeed complex and dynamic, the total problem must be structured and decisions made using a planning method capable of integrating the knowledge and skills of many people and organizations. The "inductive approach" is suitable only for the special studies needed to support the main stream of this planning effort.

The Systems Planning Procedure

Basically, the "systems approach" consists of the use of a problem-defining/problem-solving cycle, which is used successively at a number of levels of plan development. This cycle is shown in Chart 1. It begins with a general statement of the problem, known as the objectives. The second step is to completely identify the constraints or environment of the problem in such categories as: the financial situation and limitations, timing limitations, policy restrictions, and special problems.

After the objectives and constraints have been determined, they must be translated into a complete statement of the problem. Additional work is usually required to do this. For example, the financial situation and limitations may be expected to change with time, therefore, the translation step involves making interpretations and projections of the constraints into the future. Also, if possible, the objectives should be quantified into measurable goals.

After the problem has been defined, the analytical problem-solving process can begin. This consists of identifying all of the elements or parts of the problem, determining the relationships between the elements, and their requirements. A number of candidate solutions or combinations of the elements are then devised. (An example, which illustrates this analytical process as it applies to the planning of a vocational education program, will be given later.)

The relative merit of each candidate solution is determined by estimating the rating of each with respect to selection criteria, such as: growth, skill level, and cost, which can be given objective ratings, and also attractiveness and capability, which can only be given subjective ratings. Subjective criteria are usually just as important in the decision-making process as the objective criteria, and therefore must be considered. Although the systems planning process cannot omit the subjective aspects of the decision-making process, the process is always made visible for review and reconsideration. The process of determining the criteria ratings and the total rating of each candidate solution is known in systems terminology as a trade-off study.

It is intended that this trade-off process should only be a guide to decision-making, and a means of making sure that all relevant criteria are used in the process. The decisions, however, may vary from the summation of the individual criteria ratings for special reasons -- which should always be stated in the plan. Although decision-making should not be a completely mechanical process, the mechanical trade-off technique (described later) is useful in reducing a large amount of objective and subjective data to manageable proportions so that decisions can be made.

The final step of the systems approach cycle consists in the synthesis of the selected system element solutions into a total system or plan. The end product of the planning cycle is then evaluated against the original objectives to determine if further planning is required.

Levels of System Planning

Two major principles of the "system approach" are: first, that the planning is accomplished in a cycle of planning steps, and second, that most complex planning situations can be broken down into a hierarchy of decision-making levels. The cycle of planning steps is applied successively at each level so that the output of one cycle becomes the input to the cycle below it. Failure to recognize that such a hierarchy of levels exists, and to identify and separate the information in each level, is a major cause of confusion in the planning of large, complex systems.

The whole planning process of cycles and levels can be structured in the form of a matrix of planning cycle steps versus levels of planning development. Such a matrix for a vocational education program plan, is shown in Chart 2. The planning levels identified in this case are: (1) Socio-economic Planning (as related to vocational education), (2) Vocational Education Program Planning, and (3) Vocational Education Resources Planning. Thus, the socio-economic situation in a State and local areas helps to define the vocational education needs and the courses required. The courses in turn serve to identify the educational resources required.

It is not necessary that all of the steps be started in the sequence shown on the chart, since many can be done concurrently, however, each step must be completed in the order shown. The planning system is basically deductive and each step depends on outputs of the previous step before it can be completed.

Planning Flow Diagram

The problem-solving steps, described on the bottom half of the planning matrix (Chart 2) are shown depicted in the flow diagram, Chart 3. The flow diagram is organized in the same three planning levels shown in chart 2. These levels are represented by three columns: (1) Socio-Economic Planning, (2) Vocational Education Program Planning, and (3) Vocational Education Resources Planning. The diagram is also divided horizontally into two organizational levels of planning with respect to the State and the local area (district or county), so that Chart 3 shows the interaction between the State and local as the planning proceeds. It also shows that the State is in a position of leadership at every planning level, and that it initiates the planning by providing industry ratings, employment needs data, and educational policies for guidance to the local area planner.

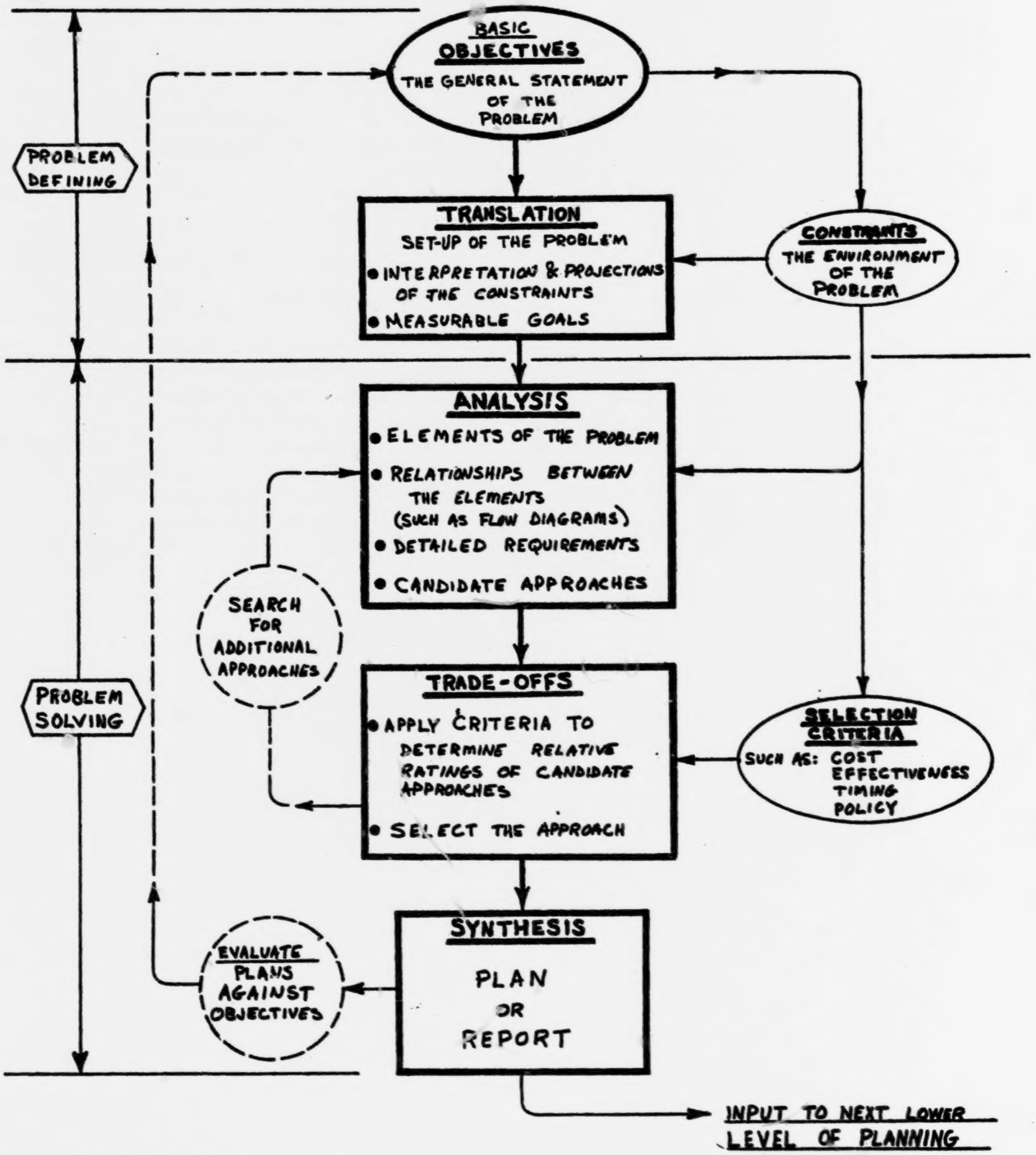
This total system approach also provides a unified decision-making process in the State. The selection, criteria, shown in blocks 5, 16 and 25 of the flow diagram, is used both at the local level to form programs, and at the State level to review and approve (or reject) them. In this way the possible differences in opinion are narrowed down to the choice of candidate programs to evaluate, and to the subjective criteria used in the evaluation. (An explanation of objective and subjective criteria is provided later in this section).

Implementation of the Planning Procedure

A series of five planning forms have been designed to implement the systems philosophy previously described. When these forms are used according to the instructions, which follow, it is not necessary (although desirable) to understand the philosophy behind them. Of course systems planning can never be reduced to a purely mechanical procedure. The forms provided are work-sheets to record essential input data, the invention and decision process, and the final synethesized system. In most cases side studies will be conducted to support this main stream of planning activity.

CHART 1

THE SYSTEMS APPROACH CYCLE


BASIC OBJECTIVES
THE GENERAL STATEMENT OF THE PROBLEM
PROBLEM DEFINING
TRANSLATION
SET-UP OF THE PROBLEM
• INTERPRETATION & PROJECTIONS OF THE CONSTRAINTS
• MEASURABLE GOALS
CONSTRAINTS
THE ENVIRONMENT OF THE PROBLEM
ANALYSIS
• ELEMENTS OF THE PROBLEM
• RELATIONSHIPS BETWEEN THE ELEMENTS (SUCH AS FLOW DIAGRAMS)
• DETAILED REQUIREMENTS
• CANDIDATE APPROACHES
SEARCH FOR ADDITIONAL APPROACHES
PROBLEM SOLVING
TRADE-OFFS
• APPLY CRITERIA TO DETERMINE RELATIVE RATINGS OF CANDIDATE APPROACHES
• SELECT THE APPROACH
SELECTION CRITERIA
SUCH AS: COST
EFFECTIVENESS
TIMING
POLICY
SYNTHESIS
PLAN OR REPORT
EVALUATE PLANS AGAINST OBJECTIVES
INPUT TO NEXT LOWER LEVEL OF PLANNING

PENNA. VOC-ED STUDY

'ENNA, VO . ED. STUDY – 19.8/9.

CHART 2

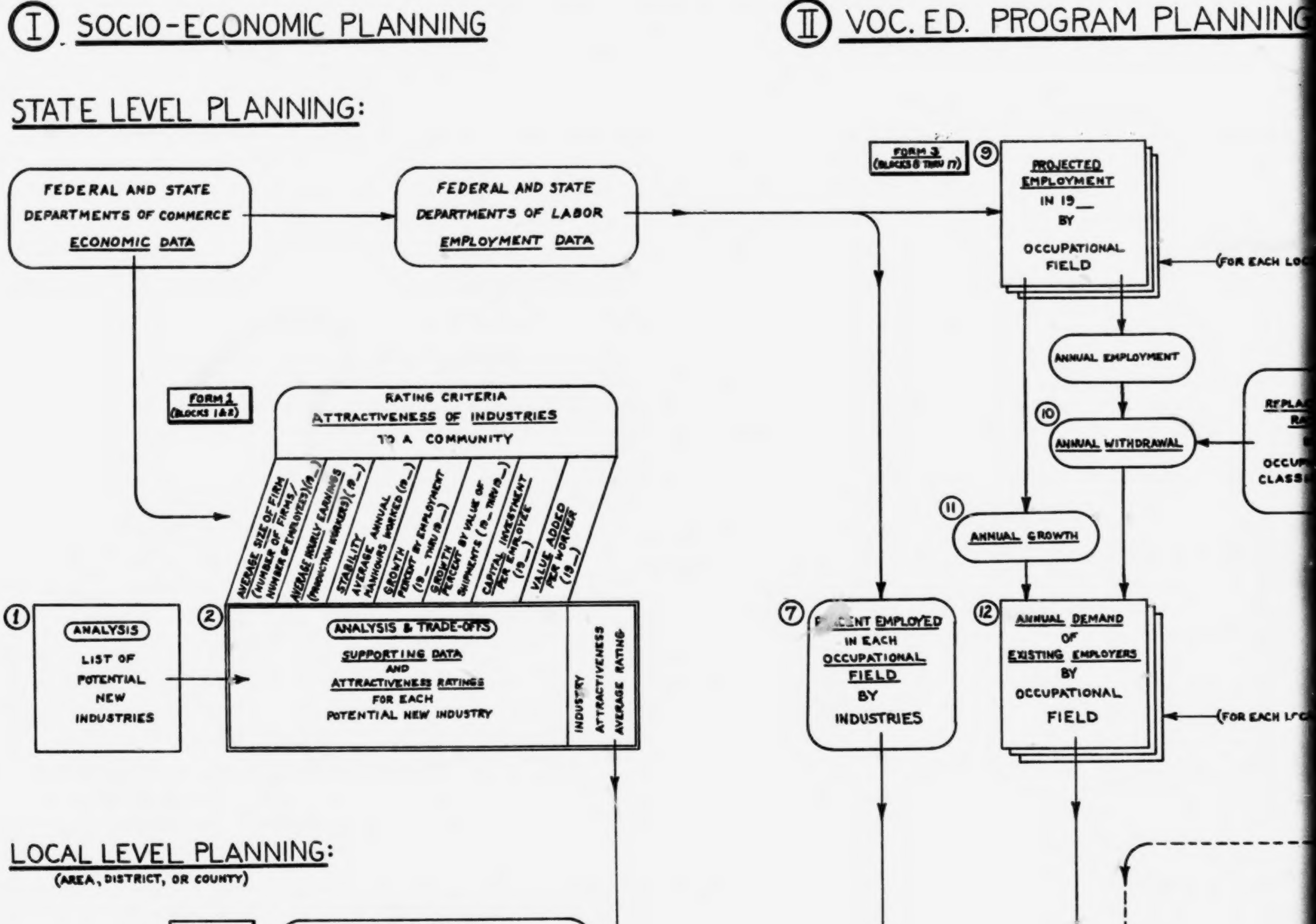
PROCEDURE FOR VOCATIONAL EDUCATION PROGRAM PLANNING

		← (PLAN DEVELOPMENT LEVELS) →		
	PLANNING CYCLE STEPS	① SOCIO-ECONOMIC PLANNING	② VOC. ED. PROGRAM PLANNING	③ VOC. ED. RESOURCES PLANNING
(PROBLEM DEFINING)	**OBJECTIVES** GENERAL STATEMENT OF THE PROBLEM	(1.1) DETERMINE THE SOCIO-ECONOMIC NEEDS AND PLANS OF A LOCAL AREA WHICH AFFECT THE PLANNING OF A VOCATIONAL AND TECHNICAL EDUCATION PROGRAM.	(2.1) DEFINE A VOCATIONAL AND TECHNICAL EDUCATION PROGRAM IN TERMS OF OCCUPATIONAL FIELDS AND COURSES WHICH WILL IMPROVE THE LOCAL SOCIO-ECONOMIC SITUATION.	(3.1) DETERMINE THE RESOURCE REQUIREMENTS AND THE COSTS TO IMPLEMENT THE VOCATIONAL AND TECHNICAL EDUCATION PROGRAM.
	CONSTRAINTS THE EXISTING CONDITIONS AND ENVIRONMENT OF THE PROBLEM	(1.2) IDENTIFICATION OF EXISTING SOCIO-ECONOMIC CONDITIONS WHICH INFLUENCE THE PLANNING OF A VOC. ED. PROGRAM: • SOCIO-ECONOMIC NEEDS. • INDUSTRY NEEDS SURVEYS. • SPECIAL SOCIO-ECONOMIC PROBLEMS.	(2.2) IDENTIFICATION OF EXISTING AND PRESENTLY PLANNED PROGRAMS (AS DEFINED BY COURSES OF OCCUPATION'L INSTRUCTION). SURVEYS OF THE SUPPLY OF STUDENTS AND THEIR OCCUPATIONAL PREFERENCES.	(3.2) IDENTIFICATION OF EXISTING AND PRESENTLY PLANNED -- • PROGRAMS (AS DEFINED BY COURSE/RESOURCE COMBINATIONS). • FACILITIES AND MAJOR EQUIPMENT. FINANCIAL AND RESOURCE PROCUREMENT LIMITATIONS.
	TRANSLATION PROBLEM SET-UP: 1. INTERPRETATIONS AND PROJECTIONS OF CONSTRAINTS. 2. MEASURABLE GOALS BASED ON THE OBJECTIVES.	(1.3) THE SOCIO-ECONOMIC PROBLEM: • INTERPRETATION OF THE SOCIO-ECONOMIC INFORMATION. • PROJECTIONS OF THE SOCIO-ECONOMIC INFORMATION AND INTERPRETATIONS INTO THE FUTURE. • MEASURABLE (LOCAL AREA) SOCIO-ECONOMIC GOALS.	(2.3) THE VOC. ED. PLANNING PROBLEM: • THE TRANSLATION OF INDUSTRY EMPLOYMENT NEEDS (GROWTH AND REPLACEMENT) INTO OCCUPATIONAL TRAINING NEEDS. • MEASURABLE (LOCAL AREA) VOC. ED. PROGRAM GOALS.	(3.3) PLANNING PROBLEM (CONTINUED): • THE TRANSLATION OF COURSE REQUIREMENTS INTO RESOURCE REQUIREMENTS. • PROJECTIONS OF THE FOLLOWING INTO THE FUTURE: • RESOURCE UNIT COSTS • TECHNOLOGICAL DEVELOPMENTS
(PROBLEM SOLVING)	**ANALYSIS** 1. IDENTIFICATION OF SYSTEM ELEMENTS. 2. DETERMINATION OF THE RELATIONSHIPS BETWEEN THE ELEMENTS. 3. DETAILED REQUIREMENTS. 4. CANDIDATE APPROACHES.	(1.4) STEPS: SEE CHART 3 • CONSTRUCT A LIST OF POTENTIAL NEW INDUSTRIES. • OBTAIN DATA RELATIVE TO CRITERIA, WHICH CAN BE USED TO RATE THE ATTRACTIVENESS OF POTENTIAL NEW INDUSTRIES TO A TYPICAL COMMUNITY.	(2.4) STEPS: SEE CHART 3 • DETERMINE THE ANNUAL EMPLOYMENT NEEDS OF POTENTIAL NEW INDUSTRIES. • DETERMINE THE ANNUAL NEEDS OF EXISTING INDUSTRIES. • DETERMINE TOTAL OCCUPATIONAL TRAINING NEEDS. • SHORTAGES AND SURPLUSES.	(3.4) STEPS: SEE CHART 3 • DETERMINE THE RESOURCE REQUIREMENTS PER COURSE. • DETERMINE THE OPERATING AND CAPITAL COSTS FOR EACH COURSE. • DETERMINE ALTERNATIVE PROGRAMS (COURSE/RESOURCE COMBINATIONS).
	TRADE-OFFS 1. DETERMINE SELECTION CRITERIA. 2. DETERMINE RATING OF EACH CANDIDATE APPROACH USING EACH CRITERIA. 3. SUMMARIZE RATINGS AND MAKE SELECTIONS.	(1.5) DETERMINE RATINGS OF POTENTIAL NEW INDUSTRIES USING TWO CATEGORIES OF CRITERIA AS FOLLOWS: • ATTRACTIVENESS OF THE INDUSTRIES TO THE COMMUNITY. • ATTRACTIVENESS OF POTENTIAL NEW INDUSTRIES TO LOCAL AREA. (USE PRODUCT OF EACH TOTAL RATING) SELECTION OF POTENTIAL NEW INDUSTRIES FOR PLANNING PURPOSES.	(2.5) DETERMINE SOCIO-ECONOMIC VALUE RATING OF EACH OF THE OCCUPATIONAL TRAINING NEEDS USING CRITERIA AS: • OCCUPATIONAL DENSITY • OCCUPATIONAL GROWTH • LABOR SHORTAGE • SKILL LEVEL. SELECTION OF COURSES OF OCCUPATIONAL INSTRUCTION.	(3.5) DETERMINE RATINGS FOR EACH COURSE/RESOURCE COMBINATIONS USING CRITERIA SUCH AS: • SOCIO-ECONOMIC VALUE • RESOURCES COST/STUDENT • VALUE RATING/COST • FUNDING AVAILABILITY • COURSE ATTRACTIVENESS SELECTION OF VOC. ED. PROGRAMS
	SYNTHESIS SYNTHESIZE SELECTED APPROACHES INTO A SYSTEM OR PLAN. (INPUT TO THE FOLLOWING PLANNING LEVEL)	(1.6) LOCAL AREA SOCIO-ECONOMIC DEVELOPMENT PLAN • RESOURCE DEVELOPMENT PROGRAMS. • INDUSTRIAL DEVELOPMENT NEEDS. • ARRANGEMENTS WITH INDUSTRIES. (INPUT TO LEVEL 2)	(2.6) LOCAL AREA VOCATIONAL AND TECHNICAL EDUCATION PROGRAM (AS DEFINED BY) • OCCUPATIONAL FIELDS. • COURSES OF OCCUPATIONAL INSTRUCTION. (INPUT TO LEVEL 3)	(3.6) LOCAL AREA VOCATIONAL AND TECHNICAL EDUCATION PROGRAM • OCCUPATIONAL FIELDS. • COURSES OF OCCUPATIONAL INSTRUCTION. • RESOURCE REQUIREMENTS. • COST ESTIMATES AND FUNDING SOURCES. (LEVELS 2 & 3 ARE ITERATED)

R. W.

PENNA VOC ED. STUDY -1968/9.

STATE/LOCAL VOCATIONAL EDUCATION


Ⅰ. SOCIO-ECONOMIC PLANNING
Ⅱ VOC. ED. PROGRAM PLANNING
STATE LEVEL PLANNING:
FEDERAL AND STATE DEPARTMENTS OF COMMERCE ECONOMIC DATA
FEDERAL AND STATE DEPARTMENTS OF LABOR EMPLOYMENT DATA
FORM 1 (BLOCKS 1&2)
RATING CRITERIA ATTRACTIVENESS OF INDUSTRIES TO A COMMUNITY
AVERAGE SIZE OF FIRM (NUMBER OF FIRMS/ NUMBER OF EMPLOYEES)(19__)
AVERAGE HOURLY EARNINGS (PRODUCTION WORKERS)(19__)
STABILITY AVERAGE ANNUAL MANHOURS WORKED (19__)
GROWTH PERCENT BY EMPLOYMENT (19__ THRU 19__)
GROWTH PERCENT BY VALUE OF SHIPMENTS (19__ THRU 19__)
CAPITAL INVESTMENT PER EMPLOYEE (19__)
VALUE ADDED PER WORKER (19__)
① ANALYSIS LIST OF POTENTIAL NEW INDUSTRIES
② ANALYSIS & TRADE-OFFS SUPPORTING DATA AND ATTRACTIVENESS RATINGS FOR EACH POTENTIAL NEW INDUSTRY
INDUSTRY ATTRACTIVENESS AVERAGE RATING
FORM 3 (BLOCKS 8 THRU 17)
⑨ PROJECTED EMPLOYMENT IN 19__ BY OCCUPATIONAL FIELD
(FOR EACH LO
ANNUAL EMPLOYMENT
⑩ ANNUAL WITHDRAWAL
REPLA RA OCCUP CLASS
⑪ ANNUAL GROWTH
⑦ PERCENT EMPLOYED IN EACH OCCUPATIONAL FIELD BY INDUSTRIES
⑫ ANNUAL DEMAND OF EXISTING EMPLOYERS BY OCCUPATIONAL FIELD
(FOR EACH LO
LOCAL LEVEL PLANNING: (AREA, DISTRICT, OR COUNTY)
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RATING CRITERIA ATTRACTIVENESS OF THE LOCAL AREA TO POTENTIAL NEW INDUSTRIES
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HUMAN RESOURCES
PRODUCED RESOURCES
SUPPORTING INDUSTRIES
PROXIMITY TO CUSTOMERS
SPECIAL REQUIREMENTS
LAND REQUIREMENTS
RAW MATERIALS
RIVERS AND LAKES
LABOR QUALITY
LABOR QUANTITY
LABOR COST ADVANTAGE
TRANSPORTATION SERVICE
TRANS. COST ADVANTAGE
COMMUNITY UTILITIES
EDUCATION & CULTURE
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④ ANALYSIS LIST OF POTENTIAL NEW INDUSTRIES.
⑤ TRADE-OFFS ATTRACTIVENESS RATINGS OF THE LOCAL AREA FOR EACH POTENTIAL NEW INDUSTRY.
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• INDUSTRY NEEDS SURVEYS.
• SPECIAL SOCIO-ECONOMIC PROBLEMS.
⑥ SYNTHESIS
• RESOURCE DEVELOPMENT PROGRAMS
• INDUSTRIAL DEVELOPMENT NEEDS
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⑮ • ANNUAL NEED. (BLOCK 13 – BLOCK 14)
⑭ CONSTRAINTS
• EXISTING VOCATIONAL EDUCATION PROGRAM.
• TOTAL SUPPLY OF TRAINED PERSONS IN 19__ (ALL SOURCES)
⑯ TRADE- SOCIO-ECO RATINGS OCCUPATION
OCCUPAT SOCIO R
OCCUPATIONAL DENSITY
OCCUPATIONAL GROWTH
⑰ FO (BLOCKS
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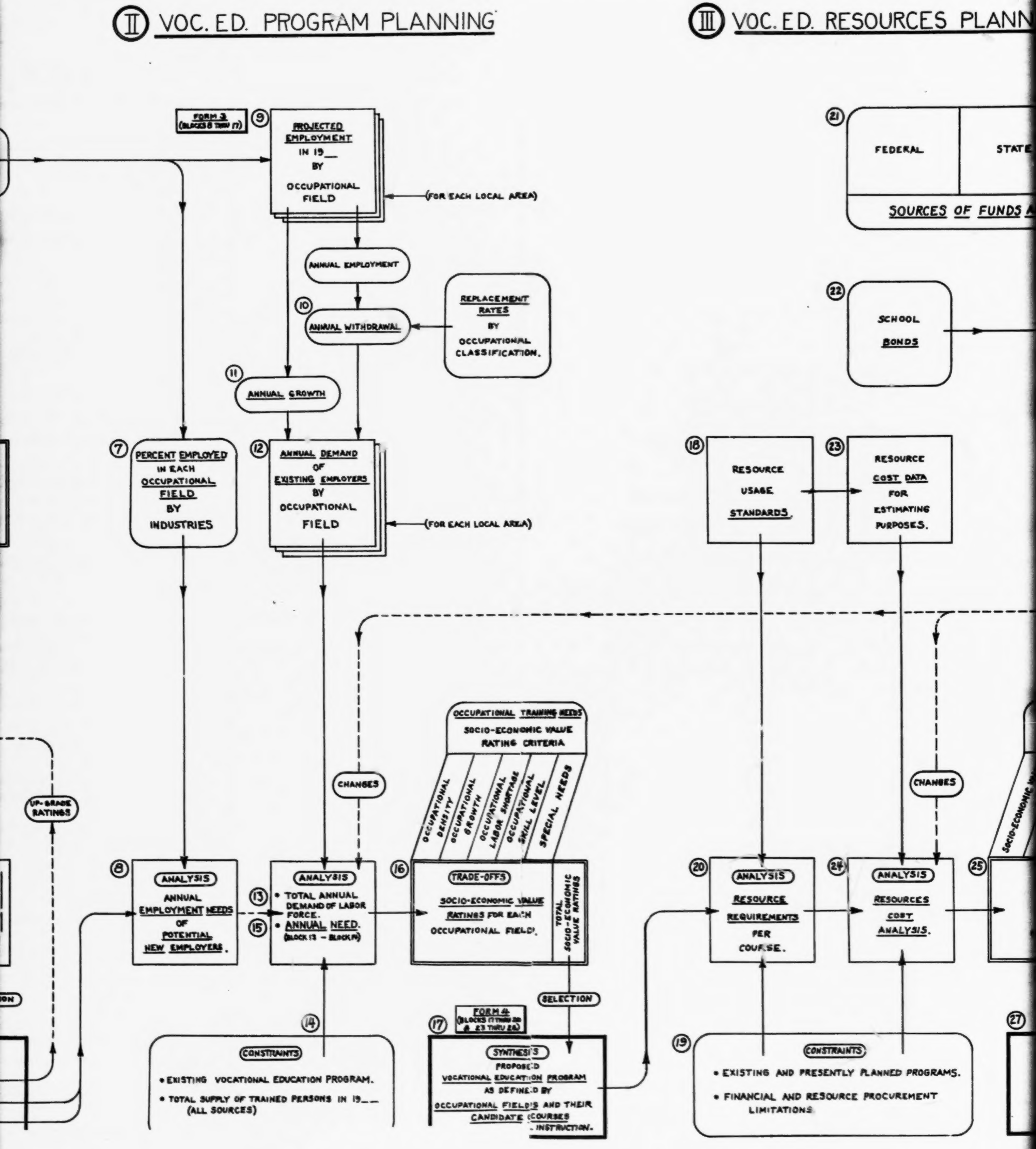
STATE/LOCAL VOCATIONAL EDUCATION PROGRAM PLANNING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III VOC. ED. RESOURCES PLANN
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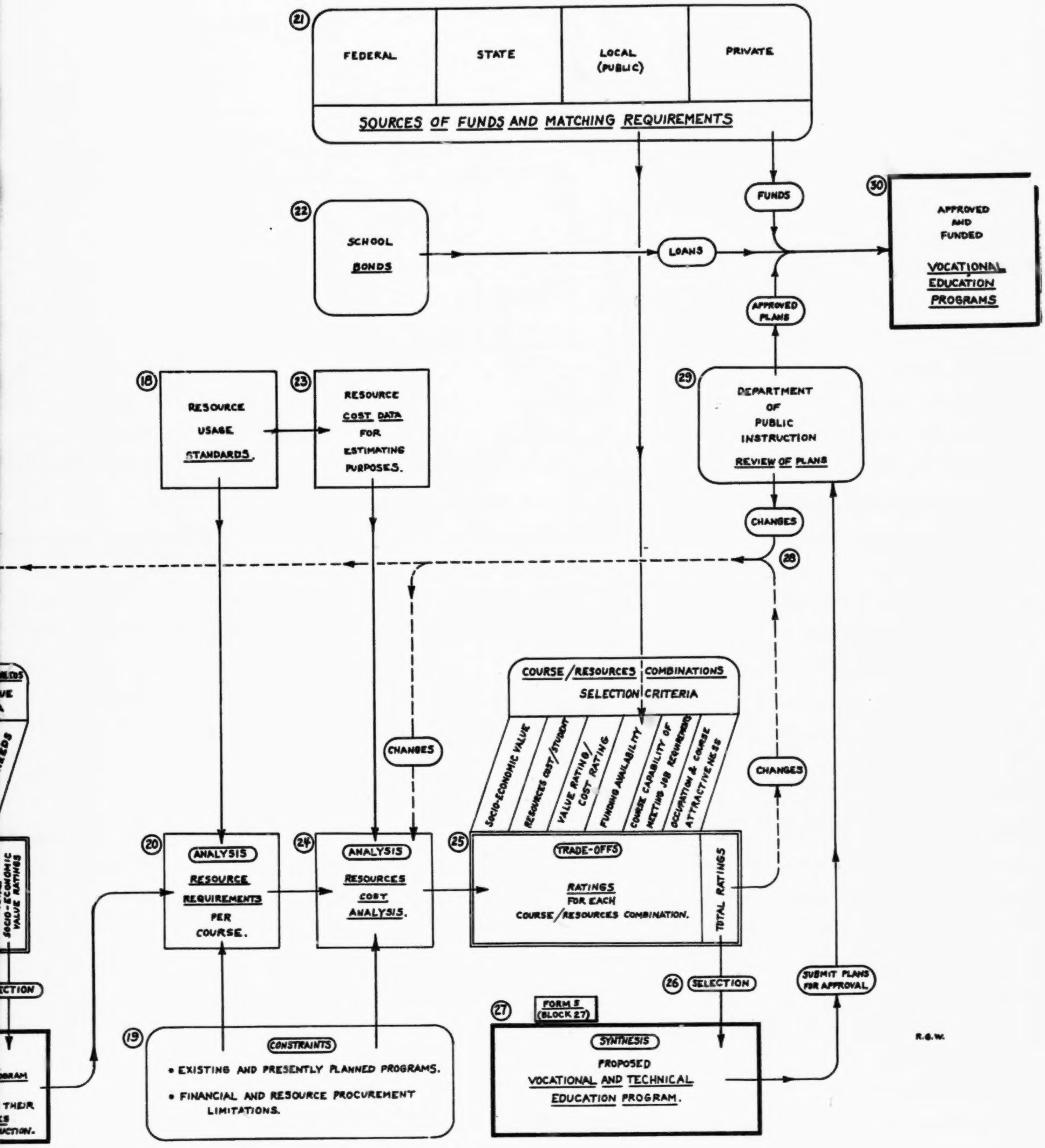
GRAM PLANNING

CHART 3

FEB. 15, 1969

III VOC. ED. RESOURCES PLANNING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INDUSTRY RATINGS

(SHEET 1 OF 2) **FORM 1**

[illegible] RATINGS AS FOLLOWS:

1. DIVIDE THE TOTAL RANGE OF DATA IN EACH COLUMN INTO 10 PARTS.
2. RANK EACH PART WITH 1 ASSIGNED TO THE LOWEST PART, AND 10 TO THE HIGHEST.
3. PUT THE ASSIGNED NUMBER IN THE RATING COLUMN.
4. ADD THE RATINGS FOR EACH POTENTIAL NEW INDUSTRY.
5. DIVIDE THE TOTAL OF THE RATINGS BY THE NUMBER OF CRITERIA USED.

LINE NUMBER	POTENTIAL NEW INDUSTRIES	RATING CRITERIA--ATTRACTIVENESS OF POTENTIAL NEW INDUSTRIES														TOTAL OF THE RATINGS	AVERAGE RATING
		AVERAGE SIZE OF FIRM (NUMBER OF EMPLOYEES/ NUMBER OF FIRMS)		AVERAGE HOURLY EARNINGS (PRODUCTION WORKERS)		STABILITY (AVERAGE ANNUAL HOURS WORKED)		GROWTH (PERCENT CHANGE IN EMPLOYMENT) (+ OR -)		GROWTH (PERCENT CHANGE IN VALUE OF SHIPMENTS (+ OR -)		CAPITAL INVESTMENT PER EMPLOYEE		VALUE ADDED PER WORKER			
		1963 DATA	RATING	1966 DATA	RATING	1966 DATA	RATING	1958 THRU 1966 DATA	RATING	1958 THRU 1966 DATA	RATING	1966 DATA	RATING	1966 DATA	RATING		
1	Ammunition, n.e.c.	856	9	$2.82	5	1994	4	3.75	10	5.80	10	$ 319	1	12000	2	41	5.6
2	Cath. Ray Pic. Tubes	73	1	2.60	4	2181	8	2.89	7	5.10	9	2928	7	24100	4	40	5.5
3	Semiconductors	655	7	2.32	3	1999	4	3.52	10	4.49	7	1503	3	14100	2	36	5.1
4	Computer & Rel. Mach.	452	5	3.19	6	2085	6	1.68	3	4.38	7	1191	3	34800	5	35	5
5	Guns,Howitzers,Mortars	409	4	2.61	4	2038	5	2.98	6	4.15	6	766	2	16800	2	29	4.1
6	Tufted Carpets, Rugs	109	1	1.92	2	2190	9	2.45	6	3.80	5	954	2	16900	2	27	3.6
7	Sm. Arms, 30 mm	192	2	2.87	5	2116	7	1.92	4	3.46	4	687	1	17200	2	25	3.4
8	Elect. Components	101	1	2.16	3	2018	4	2.15	5	3.35	4	734	2	13300	2	21	3
9	Primary Nonferr. Met.	158	2	3.29	6	2142	7	2.74	7	3.33	4	4610	10	25100	4	40	5.5
10	Optical Inst. & Lens.	44	1	3.09	6	2102	6	2.43	6	3.23	3	741	2	20800	3	27	3.6
11	Nonferrous Forgings	185	2	3.51	7	2209	9	2.06	4	3.16	3	2763	6	19900	3	34	4.6
12	R.R. and Rapid Transit Cars	45	1	3.49	7	2009	4	1.80	3	3.02	3	802	2	17800	2	22	3.1
13	Ind.Trucks & Tractors	57	1	3.08	6	2126	7	1.78	3	2.94	3	701	1	22700	3	24	3.3
14	Primary Metal n.e.c.	21	1	2.91	5	2161	8	1.83	4	2.83	2	1484	3	18900	3	26	3.5
15	Sm. Arms Ammunition	287	3	3.27	6	2090	6	2.12	5	2.79	2	430	1	[illegible]4000	2	25	3.4
16	Surg. & Med. Inst.	59	1	2.40	3	2004	4	1.71	3	2.76	2	760	2	17100	2	17	2.3
17	Photographic Equip.	120	2	3.46	7	1973	3	1.40	2	2.73	2	1760	4	41200	7	27	3.6
18	Stencilling and Marking Devices	13	1	2.63	4	1951	2	1.60	3	2.71	2	289	1	23000	3	16	2.2
19	Metal Cutting Mach.	77	1	3.45	7	2240	10	1.51	2	2.69	2	938	2	22300	3	27	3.6
20	Radio TV Comm. Equip.	387	4	3.19	6	1995	4	2.44	6	2.65	2	498	1	23300	3	26	3.5
21	Radio TV Rec. Sets	252	3	2.38	3	1949	2	1.96	4	2.64	2	930	2	15300	2	18	2.4
22	Fabric Finishing	11	1	2.36	3	2230	10	1.54	2	2.61	2	1317	3	12200	2	23	3.2
23	Household Furn. n.e.c.	27	1	1.92	2	2034	5	2.09	4	2.55	1	338	1	10400	1	15	2.1
24	Industrial Controls	77	1	2.96	5	2094	6	1.69	3	2.54	1	686	1	22800	3	20	2.8
25	Nonferr. Wire Drawing	26	1	2.98	5	2164	8	1.33	2	2.53	1	786	2	24800	4	23	3.2
26	X-Ray & Therap. App.	107	1	3.05	6	2066	5	1.59	3	2.53	1	548	1	30800	5	22	3.1
27	Textile-Throwing & Winding Mill	80	1	1.69	1	2014	4	1.37	2	2.51	1	893	2	9600	1	12	1.5
28	Transportation Eq.n.e.c.	15	1	2.21	3	1967	3	1.99	4	2.50	1	826	2	12200	2	16	2.2
29	Fab. Metal Prod.	22	1	2.62	4	2002	4	1.85	4	2.50	1	850	2	14800	2	18	2.4
30	Plastics Products	38	1	2.24	3	2073	6	1.93	4	2.49	1	1467	3	13800	2	20	2.8

PREPARED BY: J. Ross DATE: 2/15/69

INDUSTRY RATINGS

(SHEET 2 OF 2) FORM 1

DETERMINE RATINGS AS FOLLOWS:
1. DIVIDE THE TOTAL RANGE OF DATA IN EACH COLUMN INTO 10 PARTS.
2. RANK EACH PART WITH 1 ASSIGNED TO THE LOWEST PART, AND 10 TO THE HIGHEST.
3. PUT THE ASSIGNED NUMBER IN THE RATING COLUMN.
4. ADD THE RATINGS FOR EACH POTENTIAL NEW INDUSTRY.
5. DIVIDE THE TOTAL OF THE RATINGS BY THE NUMBER OF CRITERIA USED.

RATING CRITERIA -- ATTRACTIVENESS OF POTENTIAL NEW INDUSTRIES

LINE NUMBER	POTENTIAL NEW INDUSTRIES	AVERAGE SIZE OF FIRM (NUMBER OF EMPLOYEES/NUMBER OF FIRMS)		AVERAGE HOURLY EARNINGS (PRODUCTION WORKERS)		STABILITY (AVERAGE ANNUAL HOURS WORKED)		GROWTH (PERCENT CHANGE IN EMPLOYMENT) (+ OR -)		GROWTH (PERCENT CHANGE IN VALUE OF SHIPMENTS (+ OR -)		CAPITAL INVESTMENT PER EMPLOYEE		VALUE ADDED PER WORKER		TOTAL OF THE RATINGS	AVERAGE RATING
		19 63 DATA	RATING	19 66 DATA	RATING	19 66 DATA	RATING	19 58 THRU 19 66 DATA	RATING	19 58 THRU 19 66 DATA	RATING	19 66 DATA	RATING	19 66 DATA	RATING		
31	Coated Fab. Not. Rubb.	119	2	2.75	5	2167	8	1.74	3	2.41	1	1612	4	17800	2	25	3.4
32	Mach. Tool Access.	56	1	3.14	6	2231	10	1.35	2	2.41	1	949	2	21600	3	25	3.4
33	Metal Coating Engr.	16	1	2.45	4	2001	4	1.61	3	2.39	1	710	1	12800	2	16	2.2
34	Truck Trailers	111	1	2.87	5	1965	3	1.79	3	2.38	1	907	2	13800	2	17	2.3
35	Ind. Patterns	8	1	4.48	10	2102	6	1.37	2	2.37	1	N.A.		17500	2	22	3.4
36	Hoists,Cranes,Monorail	79	1	3.42	7	2144	7	1.73	3	2.37	1	612	1	20200	3	23	3.2
37	Trailer Coaches	62	1	2.38	3	1902	1	2.06	4	2.36	1	1085	2	11100	1	13	1.6
38	Sec.Metal Nonferrous	33	1	2.82	5	2111	7	1.16	1	2.36	1	1766	4	23500	3	22	3.1
39	Copper Roll & Drawing	48	1	3.38	7	2162	8	1.01	1	2.35	1	1466	3	27000	4	25	3.4
40	Knit Fabric Mills	48	1	2.04	2	2153	8	1.74	3	2.35	1	1860	4	14600	2	21	3
41	Truck & Bus Bodies	41	1	2.60	4	2084	6	1.58	3	2.33	1	1216	3	12500	2	20	2.8
42	Serv. Ind. Mach.	30	1	2.83	5	2157	8	1.73	3	2.33	1	4267	10	23900	3	31	4.3
43	Men's Slacks	110	1	1.58	1	1874	1	1.76	3	2.30	1	1584	3	5800	1	11	1.4
44	Toilet Articles	50	1	2.44	3	1965	3	1.37	2	2.29	1	825	2	66300	10	22	3.1
45	Metal Form Mach. Tool	60	1	3.46	7	2268	10	1.26	1	2.29	1	972	2	20700	3	25	3.4
46	Spec. Ind. Mach.	45	1	3.10	6	2225	9	1.36	2	2.27	1	986	2	21000	3	24	3.3
47	Typewriters	1060	10	2.79	5	2048	5	1.10	1	2.24	1	892	2	25000	4	28	3.7
48	Gen. Ind. Machinery	45	1	2.96	5	2073	6	1.46	2	2.23	1	839	2	25000	4	21	3
49	Metal Coat. Engr.	77	1	2.45	4	2240	10	1.61	3	2.23	1	938	2	22300	3	24	3.3
50	Engine Elect. Equip.	222	3	3.10	6	2090	6	1.37	2	2.21	1	732	2	17500	2	22	3.1

PREPARED BY: J. Ross DATE: 1/16/69

PENNA. VOC. ED. STUDY - 1968/9. FEB. 15, 1969.

COMMUNITY RATINGS (SHEET 1 OF 1) FORM 2

INSTRUCTIONS:
1. ENTER RATINGS 1 TO 10 IN EACH BLOCK.
2. ENTER A DASH IF CRITERION IS NOT APPLIED.
3. ENTER THE AVERAGE RATING IN THE "FORM 2" COLUMN(*)
4. ENTER THE AVERAGE RATINGS FROM FORM 1 IN THE "FORM 1" COLUMN.
5. MULTIPLY THE TWO AVERAGE RATINGS TOGETHER.
6. SELECT POTENTIAL NEW INDUSTRIES ON THE BASIS OF THE RATINGS.

RATING CRITERIA --ATTRACTIVENESS OF THE COMMUNITY TO POTENTIAL NEW INDUSTRIES

LINE NUMBER	POTENTIAL NEW INDUSTRIES	LOCATION CONSIDERATIONS			NATURAL RESOURCES			HUMAN RESOURCES			PRODUCED RESOURCES				OTHER	AVERAGE RATINGS			SELECTION
																FORM 2*	FORM 1		
		SUPPORTING INDUSTRIES	PROXIMITY TO CUSTOMERS	SPECIAL REQUIREMENTS	LAND REQUIREMENTS	RAW MATERIALS	RIVERS AND LAKES	LABOR QUALITY	LABOR QUANTITY	LABOR COST ADVANTAGE	TRANSPORTATION SERVICE	TRANSPORTATION COST ADVANTASE	COMMUNITY UTILITIES	EDUCATION AND CULTURE		ATTRACTIVENESS OF COMMUNITY	ATTRACTIVENESS OF INDUSTRIES	MULTIPLICATION OF AVERAGE RATINGS	
A	THE FIVE HIGHEST RATED MFG. INDUSTRIES AMONG THE 50 FASTEST GROWING IN U.S.A.																		
1	Ammunition, n.e.c.	8	-	-	-	8	-	5	7	-	9	8	9	3		7.1	5.6	40	
2	Cath. Ray Pic. Tubes	5	-	-	-	7	-	8	8	-	8	-	5	8		7	5.5	39	
3	Semi-conductors	-	-	-	-	-	-	8	7	-	9	8	7	8		7.5	5.1	38	
4	Comput. & Rel. Mach.	7	8	-	-	-	-	9	8	-	5	8	7	9		7.5	5	38	
5	Prim. Nonferr. Met.	6	7	9	8	10	-	5	6	-	7	6	9	4		7	5.5	39	
B	SIX OF THE 50 FASTEST GROWING MFG. INDUSTRIES EXISTING IN CUMBERLAND-PERRY COUNTIES																		
1	Tuft. Carpets, Rugs	5	8	-	-	7	-	4	7	8	9	7	9	9		7.3	3.6	26	
2	Electronc. Compon.	4	6	-	-	4	-	8	5	8	8	7	9	8		6.7	3	20	
3	R.R. & Rapid Transit Cars	6	7	9	-	-	-	6	6	4	9	5	8	6		6.6	3.1	20	
[illegible]	Plastic Products	7	5	-	-	-	-	5	5	3	8	5	7	6		5.6	2.8	16	
5	Truck & Bus Bodies	7	7	6	5	-	-	6	5	3	8	5	7	5		5.9	2.8	17	
6	Spec. Ind. Mach.	9	8	-	-	-	-	8	6	3	6	6	9	5		6.6	4.6	30	
C	FOUR FASTEST GROWING MFG. INDUSTRIES IN CUMBERLAND-PERRY NOT INCLUDED ABOVE																		
1	Prepared Feeds	3	9	-	6	8	-	6	7	5	8	7	9	4		6.6	3.7	24	
2	Rub. & Misc. Prod.	8	8	-	-	-	-	7	8	6	8	7	9	7		7.5	3.2	24	
3	Fabr. Metal Prods.	8	8	-	5	8	-	8	8	4	9	9	8	6		7.4	2.4	18	
4	Mach. Except Elect.	8	8	-	-	8	-	8	8	4	8	7	8	5		7.2	5.4	39	
D	THREE MAJOR SERVICE IND. CLASSIFICATIONS IN CUMBERLAND-PERRY COUNTIES																		
1	Health	6	9	7	7	-	6	8	7	3	5	-	8	9		6.9	5.6	39	
2	Hotel & Restaurant	9	9	-	-	-	-	4	6	5	-	-	5	5		6.1	4.1	25	
3	Recreation	-	5	9	10	-	10	4	9	-	-	-	7	6		7.4	2.7	20	
E	CONSTRUCTION INDUSTRY IN CUMBERLAND-PERRY COUNTIES																		
		8	8	-	10	5	-	7	8	-	-	-	-	5		6	4.9	29	
F	TRANSPORTATION-WAREHOUSING & DISTRIBUTION IN CUMBERLAND-PERRY COUNTIES																		
		10	8	9	9	-	-	5	8	-	9	9	2	3		7.2	5.5	40	
G	AGRICULTURE IN CUMBERLAND-PERRY COUNTIES																		
		-	5	9	10	-	6	8	4	7	8	8	4	6		6.9	4.6	32	

COMMUNITY AREA: Cumberland-Perry Counties PREPARED BY: Ross-Willard-Stoner DATE: 2/15/69

NEEDS DEFINITION --VOCATIONAL AND TECHNICAL EDUCATION (SHEET 1 OF 3) FORM 3

NOTES:
(1) ENCIRCLED NUMBERS REFER TO PLANNING FLOW DIAGRAM (CHART 3).
(2) USE TOP HALF OF LINE FOR STATE FURNISHED DATA.
(3) USE BOTTOM HALF OF LINE FOR EFFECT OF LOCAL CHANGES ON DATA FURNISHED BY THE STATE.

LINE NUMBER	COLUMN 1 OCCUPATIONAL FIELD	2 ⑧ ANNUAL EMPLOYMENT NEEDS OF POTENTIAL NEW EMPLOYERS	3 EXISTING EMPLOYMENT NEEDS ⑨ PROJECTED EMPLOYMENT IN 1975	4 ⑩ ANNUAL WITHDRAWAL FROM LABOR FORCE	5 ⑪ ANNUAL GROWTH OF LABOR FORCE	6 ⑫ ANNUAL DEMAND OF EXISTING EMPLOYERS (COL. 4 + COL. 5)	7 TOTAL NEEDS ⑬ TOTAL ANNUAL DEMAND OF LABOR FORCE (COL. 2 + COL. 6)	8 ⑭ TOTAL SUPPLY OF TRAINED PERSONS IN 19__ (ALL SOURCES)	9 ⑮ ANNUAL NEED (COL. 7 MINUS COL. 8)	10 ⑯ TRADE-OFFS CRITERIA USE COL. 3 DENSITY	11 USE COL. 5 GROWTH	12 USE COL. 9 SHORTAGE	13 USE * SKILL LEVEL	14 USE REG'S SPECIAL NEEDS	15 TOTAL RATING — SOCIO-ECONOMIC VALUE	16 ⑰ TENTATIVE SELECTION
		—	397	12	14	26	—	0	26							
1	Civil Technology	0	397	12	14	26	26	0	26	1	1	1	7	0	10	12
		—	493	20	12	32	—	0	32							✓
2	Drafting & Design Tech	4	497	20	12	32	36	0	36	1	1	1	8	0	11	11
		—	286	13	11	24	—	0	24							✓
3	Electronic Tech.	10	296	13	11	24	34	0	34	1	1	1	7	0	10	12
		—	261	12	10	22	—	0	22							✓
4	Electrical Tech.	0	261	12	10	22	22	0	22	1	1	1	7	0	10	12
		—	150	5	5	10	—	0	10							
5	Medical & Dental Tech.	0	150	5	5	10	10	0	10	1	1	1	7	0	10	12
		—	504	25	19	44	—	0	44							✓
6	Technicians N.E.C.	5	509	25	19	44	49	0	49	1	1	1	7	0	10	12
		—	6550	-25	175	150	—	139	11							
7	Mgrs. & Offs. & Props.	5	6555	-25	175	150	155	139	16	8	1	5	8	0	22	3
		—	2900	-41	192	151	—	53	98							
8	Farmers & Farm Wkrs.	0	2900	-41	192	151	151	53	98	4	1	6	6	5	22	3
		—	1920	44	63	107	—	82	25							✓
9	Accounting & Bkks.	2	1922	44	63	107	109	82	27	3	1	2	7	0	13	9
		—	549	19	11	30	—	0	30							
10	Medical & Dental Secy.	0	549	19	11	30	30	0	30	2	2	2	6	0	12	10
		—	3205	101	132	233	—	194	39							✓
11	Scys. & Stenos.	4	3209	101	132	233	237	194	43	4	5	4	6	0	19	4
		—	1290	37	53	90	—	32	58							✓
12	Office Mach. Oprs.	2	1292	37	53	90	92	32	60	2	1	2	5	3	13	9
		—	1165	31	39	70	—	0	70							✓
13	Shipping & Stock Clks.	8	1173	31	39	70	78	0	78	2	1	2	6	7	18	5
		—	8830	166	282	448	—	272	176							✓
14	Typists & Other Clerical	5	8835	166	282	448	453	272	181	10	10	8	5	7	40	1
		—	7550	90	233	323	—	0	323							✓
15	Sales Workers	3	7553	90	233	323	326	0	326	9	4	7	4	6	30	2
	TOTALS →									* SUPPLEMENT TO DICTIONARY OF OCCUPATIONAL TITLES - SVP.						

COMMUNITY AREA: Cumberland-Perry PREPARED BY: Robert T. Stoner DATE: 2/15/69

PENNA VOC. ED. STUDY 1968/9. FEB. 15, 1969

NEEDS DEFINITION --VOCATIONAL AND TECHNICAL EDUCATION (SHEET 2 OF 3) FORM 3

NOTES:
(1) ENCIRCLED NUMBERS REFER TO PLANNING FLOW DIAGRAM (CHART 3).
(2) USE TOP HALF OF LINE FOR STATE FURNISHED DATA.
(3) USE BOTTOM HALF OF LINE FOR EFFECT OF LOCAL CHANGES ON DATA FURNISHED BY THE STATE.

LINE NUMBER	COLUMN → 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		⑧	EXISTING EMPLOYMENT NEEDS				TOTAL NEEDS			⑯ TRADE-OFFS						⑰
			⑨	⑩	⑪	⑫	⑬	⑭	⑮	CRITERIA						
										USE COL. 3	USE COL. 5	USE COL. 9	USE *	USE REG'L		
	OCCUPATIONAL FIELD	ANNUAL EMPLOYMENT NEEDS OF POTENTIAL NEW EMPLOYERS	PROJECTED EMPLOYMENT IN 1975	ANNUAL WITHDRAWAL FROM LABOR FORCE	ANNUAL GROWTH OF LABOR FORCE	ANNUAL DEMAND OF EXISTING EMPLOYERS (COL. 4 + COL. 5)	TOTAL ANNUAL DEMAND OF LABOR FORCE (COL. 2 + COL. 6)	TOTAL SUPPLY OF TRAINED PERSONS IN 19_67_ (ALL SOURCES)	ANNUAL NEED (COL. 7 MINUS COL. 8)	DENSITY	GROWTH	SHORTAGE	SKILL LEVEL	SPECIAL NEEDS	TOTAL RATING — SOCIO-ECONOMIC VALUE	TENTATIVE SELECTION
		—	1030	37	37	74	—	0	74							
16	Nursing R.N.	0	1030	37	37	74	74	0	74	2	1	2	6	0	11	11
		—	350	20	18	38	—	0	38							
17	Nursing P.N.	0	350	20	18	38	38	0	38	1	1	1	5	5	13	9
		—	465	20	27	47	—	0	47							✓
18	Attendants Hosp.& Inst.	0	465	20	27	47	47	0	47	1	1	1	3	6	12	10
		—	3395	113	357	470	—	0	470							✓
19	Foods Prep. & Service	0	3395	113	357	470	470	0	470	4	6	10	4	6	30	2
		—	385	4	19	23	—	0	23							
20	Laundry & Cleaning4	0	385	4	19	23	23	0	23	1	1	1	2	5	10	12
		—	1195	0	46	46	—	3	43							
21	Service Wks. Private	0	1195	0	46	46	46	3	43	2	1	2	3	8	16	6
		—	1215	44	39	83	—	0	83							✓
22	Service Workers N.E.C.	4	1219	44	39	83	87	0	87	2	1	2	2	6	13	9
		—	1091	28	27	55	—	1	54							✓
23	Auto Mechanics	2	1093	28	27	55	57	1	56	2	1	1	7	3	14	8
		—	183	6	5	11	—	0	11							✓
24	Auto Body Mechanics	0	183	6	5	11	11	0	11	1	1	1	7	5	15	7
		—	320	3	13	16	—	5	11							✓
25	Carpenters	0	320	3	13	16	16	5	11	1	1	1	7	0	10	12
		—	40	0	0	0	—	6	-6							
26	Cabinet Makers	0	40	0	0	0	0	6	-6	1	1	1	8	0	11	11
		—	730	15	34	49	—	3	46							
27	Cosmetology & Barbers	0	730	15	34	49	49	3	46	1	1	1	6	0	9	13
		—	1881	26	46	72	—	6	66							
28	Craftsmen N.E.C.	12	1893	26	46	72	84	6	78	3	1	2	7	0	13	9
		—	815	14	21	35	—	0	35							✓
29	Electricians Const.	0	815	14	21	35	35	0	35	1	1	1	7	0	10	12
		—	820	6	21	27	—	0	27							
30	Inspectors & Checkers	0	820	6	21	27	27	0	27	1	1	1	7	0	10	12
	TOTALS →															

* SUPPLEMENT TO DICTIONARY OF OCCUPATIONAL TITLES - SVP.

COMMUNITY AREA: Cumberland-Perry

PREPARED BY: Robert T. Stoner

DATE: 2/15/69

PENNA VOC. ED. STUDY 1969/9. FEB. 15, 1969

NEEDS DEFINITION --VOCATIONAL AND TECHNICAL EDUCATION (SHEET 3 OF 3) FORM 3

LINE NUMBER	COLUMN → 1	2	3	4	5	5	7	8	9	10	11	12	13	14	15	16
	NOTES: (1) ENCIRCLED NUMBERS REFER TO PLANNING FLOW DIAGRAM (CHART 3). (2) USE TOP HALF OF LINE FOR STATE FURNISHED DATA. (3) USE BOTTOM HALF OF LINE FOR EFFECT OF LOCAL CHANGES ON DATA FURNISHED BY THE STATE.	⑧	EXISTING EMPLOYMENT NEEDS				TOTAL NEEDS			⑯ TRADE-OFFS						⑰
			⑨	⑩	⑪	⑫	⑬	⑭	⑮	CRITERIA						
										USE COL. 3	USE COL. 5	USE COL. 9	USE *	USE REG'S		
	OCCUPATIONAL FIELD	ANNUAL EMPLOYMENT NEEDS OF POTENTIAL NEW EMPLOYERS	PROJECTED EMPLOYMENT IN 1975	ANNUAL WITHDRAWAL FROM LABOR FORCE	ANNUAL GROWTH OF LABOR FORCE	ANNUAL DEMAND OF EXISTING EMPLOYERS (COL. 4 + COL. 5)	TOTAL ANNUAL DEMAND OF LABOR FORCE (COL. 2 + COL. 6)	TOTAL SUPPLY OF TRAINED PERSONS IN 19__ (ALL SOURCES)	ANNUAL NEED (COL. 7 MINUS COL. 8)	DENSITY	GROWTH	SHORTAGE	SKILL LEVEL	SPECIAL NEEDS	TOTAL RATING — SOCIO-ECONOMIC VALUE	TENTATIVE SELECTION
		—	285	11	25	36	—	0	36							✓
31	Masons - Brick, etc.	0	285	11	25	36	36	0	36	1	1	1	7	5	15	7
		—	568	13	11	24	—	0	24							✓
32	Machinists, etc.	23	591	14	12	26	49	12	37	1	1	1	8	0	11	11
		—	180	0	3	3	—	0	3							
33	Meat Cutters	0	180	0	3	3	3	0	3	1	1	1	6	3	12	10
		—	2232	31	53	84	—	0	84							✓
34	Mechanics M.& R.N.E.C.	9	2241	31	53	84	93	0	93	3	1	2	7	3	16	6
		—	95	4	2	6	—	0	6							
35	Office Mach. Repair	0	95	4	2	6	6	0	6	3	1	1	6	3	14	8
		—	455	8	19	27	—	0	27							✓
36	Painters & Paper Hngrs.	0	455	8	19	27	27	0	27	1	1	1	5	5	13	9
		—	440	12	11	23	—	0	23							✓
37	Plumber & Pipe Fitters	2	442	12	11	23	25	0	25	1	1	1	7	0	10	12
		—	330	1	7	8	—	0	8							
38	Printing Craftsmen	0	330	1	7	8	8	0	8	1	1	1	8	0	11	11
		—	830	28	25	53	—	0	53							✓
39	Police & Guards	0	830	28	25	53	53	0	53	1	1	1	4	3	10	8
		—	185	3	3	6	—	17	-11							
40	Radio & TV Repair	0	185	3	3	6	6	17	-11	1	1	1	7	0	10	12
	Sheetmetal Wks. Inc.	—	205	2	3	5	—	0	5							
41	Air Cond.-Ref.	0	205	2	3	5	5	0	5	1	1	1	8	0	11	11
		—	1617	-2	80	78	—	0	78							✓
42	Textile Occupations	0	1617	-2	80	78	78	0	78	2	1	3	4	5	15	7
		—	65	0	1		—	0	1							
43	Upholstery	0	65	0	1	1	1	0	1	1	1	1	6	5	14	8
		—	495	9	12	21	—	0	21							✓
44	Welders & Cutters	32	527	10	13	23	55	0	55	1	1	1	6	5	14	8
		—					—									
	TOTALS →	132	58079	967	2218	3185	3317	825	2492	* SUPPLEMENT TO DICTIONARY OF OCCUPATIONAL TITLES - BVR.						

COMMUNITY AREA: Cumberland-Perry PREPARED BY: Robert T. Stoner DATE: 2/15/69

CANDIDATE COURSE/RESOURCES COMBINATIONS (CONSIDER AL

LINE NUMBERS (FROM FORM 3)	COLUMN → 17	18	19	20	21	22
	⑰ ← (FLOW DIAGRAM NUMBER) OCCUPATIONAL FIELD/ CANDIDATE COURSE OF OCCUPATIONAL INSTRUCTION NOTE: CANDIDATE COURSES MAY INCLUDE COMBINATIONS OR SUB-DIVISIONS OF OCCUPATIONS LISTED ON FORM 3.	NOTE: THE FOLLOWING ARE DEFINITIONS OF THE FACTORS USED IN THE COST ANALYSIS IN COLUMNS 24 THRU 34: ㉓ "A" IS 1 + % NON-INSTRUCTIONAL FLOOR SPACE. "B" IS ARCHITECTURAL ESTIMATE OF COST PER SQ. FT. "C" IS LIFE OF BOND APPLICABLE TO BUILDING (USUALLY 20 YRS.) "D" IS LIFE OF BOND APPLICABLE TO EQUIPMENT (USUALLY 10 YRS). ⑱ ⑲ ⑳ RESOURCE REQUIREMENTS PER COURSE TYPE OF SCHOOL SCHOOL (EXISTING OR PROPOSED)	TRAINING MEDIUM GRADES OF INSTRUCTION	FULL TIME ANNUAL ENROLLMENT, EXISTING / PROPOSED	MALE - FEMALE FULL TIME ANNUAL ENROLLMENT, EXISTING / PROPOSED	ESTIMATED ENTRANTS INTO LABOR FORCE
14	Typist & General Clerical	COMPREHENSIVE H.S. 16 Cumberland-Perry	Secondary Day 10-11-12	448	22-426	176
			Part-Time Evening Ungraded			
		PRIVATE POST SECONDARY Central Penn Business	Part-Time Day or Even. Ungraded	55	2-53	55
		PRIVATE POST SECONDARY Thompson Institute	Part-Time Day or Even. Ungraded	51	4-47	51
11	Secretary's & Steno. Secretarial Science	COMMUNITY COLLEGE Harrisburg Area C. C.	Full-Time Day 13-14	35	2-33	16
		PRIVATE POST SECONDARY Central Penn Business	Part-Time Day or Even. Ungraded	35	2-33	30
		PRIVATE POST SECONDARY Thompson Institute	Part-Time Day or Even. Ungraded	35	2-33	30
		COMPREHENSIVE H.S. 16 Cumberland-Perry	Secondary Day 11-12	436	6-430	168
		COMPREHENSIVE H.S. Carlisle High School	Part-Time Day or Even. Ungraded	N.A.		
		PRIVATE POST SECONDARY Harrisburg Medical Arts	Part-Time Day or Even. Ungraded	N.A.		
15	Merchandising Sales Workers	COMPREHENSIVE H.S. Some Cumberland-Perry	Secondary Day 12	N.A.		
		AREA VOC. TECH. SCH. Cumberland-Perry Area Tech.	Secondary Day 11-12	40	10-30	20
		(Shared Time)	Part-Time Cooperative	10	3-7	10

N.A. = Not Available

FEB. 15 1969

L FEASIBLE RESOURCE ALTERNATIVES)

(SHEET 1 OF 3) FORM 4

23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
	㉔ RESOURCES COST ANALYSIS											㉕ TRADE-OFFS								㉖
	OPERATING COSTS		CAPITAL COSTS						TOTAL COSTS			SELECTION CRITERIA								
			FLOOR SPACE				EQUIPMENT													
ANNUAL NEED (FROM COLUMN 9)	⑱ NUMBER OF TEACHING UNITS	ANNUAL OPERATING COST (COL. 24 × AVERAGE TEACHER SALARY +30% OVERHEAD)	⑱ INSTRUCTIONAL FLOOR SPACE (SQ. FT.)	INSTRUCTIONAL & ARCHITECTURAL FLOOR SPACE (COL. 26 × "A")	FLOOR SPACE COST (COL. 27 × "B")	ANNUAL FLOOR SPACE COST (COL. 28 ÷ "C")	⑱ ㉓ INSTRUCTIONAL EQUIPMENT COST	ANNUAL INSTRUCTIONAL EQUIPMENT COST (COL. 30 ÷ "D")	TOTAL ANNUAL RESOURCES COST (COL. 25 + COL. 29 + COL. 31)	PROPOSED FULL TIME ENROLLMENT (FROM COL. 20)	TOTAL ANNUAL RESOURCES COST PER STUDENT (COL. 32 ÷ COL 33)	RATING OF SOCIO-ECONOMIC VALUE (FROM COL. 15)	RATING OF RESOURCES COST PER STUDENT (USE COL. 34)	VALUE RATING ÷ COST RATING (COL. 35 ÷ COL. 36)	COURSE CAPABILITY OF MEETING JOB REQUIREMENTS	㉑ ㉒ FUNDING AVAILABILITY	OCCUPATION & COURSE ATTRACTIVENESS TO STUDENTS		TOTAL RATING	FINAL SELECTION
181		Suggest that high schools establish and operate terminal courses in typing D.P. card punching, filing, etc.										40	✱ 8	5	7	7	7		74	X
		See Recommendation (A)										40	10	4	8	8	10		80	X
												40	1	10	9	3	10		73	X
												40	1	10	9	3	10		73	X
43												19	2	10	9	7	9		56	X
												19	1	10	10	3	9		52	X
												19	1	10	10	3	9		52	X
												19	6	3	8	7	7		50	X
												19	10	2	6	5	6		48	X
												19	1	10	10	3	8		60	X
326		There is a supply out of the Secondary Schools. Subject usually given in the 12th grade. Not classified as vocational.										30	5	6	7	9	7		64	X
	1	10400	2400	3000	75000	3750	8000	800	14950	40	373	30	10	3	9	7	8		67	X
												30	10	3	10	9	10		72	X

✱(HIGH COST GIVES A LOW RATING)

COMMUNITY AREA: Cumberland-Perry Co's. PREPARED BY: Robert T. Stoner DATE: 3/14/69

CANDIDATE COURSE/RESOURCES COMBINATIONS (CONSIDER ALL F

LINE NUMBERS (FROM FORM 3)	COLUMN → 17	18	19	20	21	22	2
	⑰ ← (FLOW DIAGRAM NUMBER) OCCUPATIONAL FIELD/ CANDIDATE COURSE OF OCCUPATIONAL INSTRUCTION NOTE: CANDIDATE COURSES MAY INCLUDE COMBINATIONS OR SUB-DIVISIONS OF OCCUPATIONS LISTED ON FORM 3.	NOTE: THE FOLLOWING ARE DEFINITIONS OF THE FACTORS USED IN THE COST ANALYSIS IN COLUMNS 24 THRU 34: ㉓ "A" IS 1+% NON-INSTRUCTIONAL FLOOR SPACE. "B" IS ARCHITECTURAL ESTIMATE OF COST PER SQ.FT. "C" IS LIFE OF BOND APPLICABLE TO BUILDING (USUALLY 20 YRS.) "D" IS LIFE OF BOND APPLICABLE TO EQUIPMENT (USUALLY 10 YRS). ⑱⑲⑳ RESOURCE REQUIREMENTS PER COURSE TYPE OF SCHOOL SCHOOL (EXISTING OR PROPOSED)	TRAINING MEDIUM GRADES OF INSTRUCTION	FULL TIME ANNUAL ENROLLMENT, EXISTING / PROPOSED	MALE-FEMALE FULL TIME ANNUAL ENROLLMENT, EXISTING / PROPOSED	ESTIMATED ENTRANTS INTO LABOR FORCE	ANNUAL NEED
19	Foods Preparation & Serv Quantity Food's Occ.	AREA VOC.TECH.SCH. Cumberland-Perry Area Tech.	Secondary Day 11-12	40	25-15	20	4
		(Shared Time)	Part-Time Cooperative 12	10	6-4	10	
			Part-Time Evening Ungraded	N.A.			
23	Auto Engine Mechanics	AREA VOC.TECH.SCH. Cumberland-Perry Area Tech.	Secondary Day 10-11-12	40	40-0	13	
		(Shared Time)	Part-Time Evenings Ungraded	N.A.			
		COMPREHENSIVE H.S. Carlisle High Sch.	Secondary Day 10-11-12	28	28-0	9	
		INDUSTRY IN PLANT (Employer's Name)	On-the-Job Ungraded	N.A.			
32	Machine Shop Practice	AREA VOC.TECH.SCH. Cumberland-Perry Area Tech.	Secondary Day 10-11-12	40	40-0	13	
		(Shared Time)	Part-Time Cooperative 12	20	20-0	20	
			Part-Time Evening Ungraded	N.A.			
		COMPREHENSIVE H.S. Carlisle High Sch.	Secondary Day 10-11-12	34	34-0	11	
		INDUSTRY IN PLANT (Employer's Name)	Apprenticeship 2,3, or 4 Years	8	8-0	3	
		INDUSTRY IN PLANT (Employer's Name)	Vestibule Ungraded	N.A.			

N.A.= Not Available

FEB. 15 1969

EASIBLE RESOURCE ALTERNATIVES) (SHEET 2 OF 3) FORM 4

3	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
	㉔ RESOURCES COST ANALYSIS											㉕ TRADE-OFFS								㉖
	OPERATING COSTS		CAPITAL COSTS						TOTAL COSTS			SELECTION CRITERIA								
			FLOOR SPACE				EQUIPMENT													
(FROM COLUMN 9)	⑱ NUMBER OF TEACHING UNITS	ANNUAL OPERATING COST (COL. 24 × AVERAGE TEACHER SALARY +30% OVERHEAD)	⑱ INSTRUCTIONAL FLOOR SPACE (SQ. FT.)	INSTRUCTIONAL & ARCHITECTURAL FLOOR SPACE (COL. 26 × "A").	FLOOR SPACE COST (COL. 27 × "B")	ANNUAL FLOOR SPACE COST (COL. 28 ÷ "C")	⑱ ㉓ INSTRUCTIONAL EQUIPMENT COST	ANNUAL INSTRUCTIONAL EQUIPMENT COST (COL. 30 ÷ "D")	TOTAL ANNUAL RESOURCES COST (COL. 25 + COL. 29 + COL. 31)	PROPOSED FULL TIME ENROLLMENT (FROM COL. 20)	TOTAL ANNUAL RESOURCES COST PER STUDENT (COL. 32 ÷ COL. 33)	RATING OF SOCIO-ECONOMIC VALUE (FROM COL. 15)	RATING OF RESOURCES COST PER STUDENT (USE COL. 34)	VALUE RATING ÷ COST RATING (COL. 35 ÷ COL. 36)	COURSE CAPABILITY OF MEETING JOB REQUIREMENTS	㉑ ㉒ FUNDING AVAILABILITY	OCCUPATION & COURSE ATTRACTIVENESS TO STUDENTS		TOTAL RATING	FINAL SELECTION
70	1	10400	2000	2500	62500	3125	40000	4000	17525	40	438	30	* 8	4	8	7	7		64	X
												30	10	3	10	8	9		70	X
												30	8	4	7	7	6		62	
56	1	10400	2400	3000	75000	3750	40000	4000	18150	40	453	11	7	1	6	7	10		42	X
												11	9	1	6	8	7		42	
												11	6	2	9	7	8		43	X
												11	10	11	8	3	6		49	X
37	1	10400	2800	3500	87500	4375	10000	10000	24775	40	619	11	1	11	9	7	7		46	X
												4	9	1	9	8	10		41	X
												11	8	1	7	8	7		42	
												11	2	6	8	7	6		40	X
												11	10	11	10	3	9		54	X
												11	10	11	10	3	8		53	X

* (HIGH COST GIVES A LOW RATING)

COMMUNITY AREA: Cumberland-Perry Co's. PREPARED BY: Robert T. Stoner DATE: 3/14/69

CANDIDATE COURSE/RESOURCES COMBINATIONS (CONSIDER ALL F

NOTE: THE FOLLOWING ARE DEFINITIONS OF THE FACTORS USED IN THE COST ANALYSIS IN COLUMNS 24 THRU 34: ㉓
"A" IS 1+% NON-INSTRUCTIONAL FLOOR SPACE.
"B" IS ARCHITECTURAL ESTIMATE OF COST PER SQ.FT.
"C" IS LIFE OF BOND APPLICABLE TO BUILDING (USUALLY 20 YRS.)
"D" IS LIFE OF BOND APPLICABLE TO EQUIPMENT (USUALLY 10 YRS).

	COLUMN → 17	18	19	20	21	22
LINE NUMBERS (FROM FORM 3)	⑰ ← (FLOW DIAGRAM NUMBER) OCCUPATIONAL FIELD/ CANDIDATE COURSE OF OCCUPATIONAL INSTRUCTION NOTE: CANDIDATE COURSES MAY INCLUDE COMBINATIONS OR SUB-DIVISIONS OF OCCUPATIONS LISTED ON FORM 3.	⑱ ⑲ ⑳ RESOURCE REQUIREMENTS PER COURSE TYPE OF SCHOOL SCHOOL (EXISTING OR PROPOSED)	TRAINING MEDIUM GRADES OF INSTRUCTION	FULL TIME ANNUAL ENROLLMENT, EXISTING — PROPOSED	MALE - FEMALE FULL TIME ANNUAL ENROLLMENT, EXISTING — PROPOSED	ESTIMATED ENTRANTS INTO LABOR FORCE
37	Plumber & Pipe Fitters	AREA VOC. TECH. SCH. Cumberland-Perry Area Tech.	Secondary Day 10-11-12	40	40-0	13
		(shared time)	Part-Time Evening Ungraded	N.A.		
		INDUSTRY IN PLANT (Employer's Name)	Apprenticeship 4 years Ungraded	N.A.		
1	Civil Technology	COMMUNITY COLLEGE Harrisburg Area C. C.	Full-Time Day 13-14	20	19-1	10
		AREA VOC. TECH. SCH. Cumberland-Perry Area Tech.	Secondary Day 11-12	40	40-0	20
		POST SECONDARY Pa. State-York Center	Full-Time Day 13-14	23	23-0	11
2	Drafting & Design Tech.	COMMUNITY COLLEGE Harrisburg Area C. C.	Full-Time Day 13-14	36	32-4	18
		AREA VOC. TECH. SCH. Cumberland-Perry Area Tech.	Secondary Day 10-11-12	40	36-4	13
		(shared time)	Part-Time Evening Ungraded	N.A.		
8	Farmers & Farm Workers Agriculture Education	COMPREHENSIVE H.S. Some Cumberland-Perry	Secondary Day 10-11-12	259	259-0	80
		UNIVERSITY Pa. State-Extension	Conference Series Ungraded	N.A.		

N.A. = Not Available

FEB. 15 1969

EASIBLE RESOURCE ALTERNATIVES)

(SHEET 3 OF 3) **FORM 4**

3	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
	㉔ RESOURCES COST ANALYSIS											㉕ TRADE-OFFS								㉖
	OPERATING COSTS		CAPITAL COSTS						TOTAL COSTS			SELECTION CRITERIA								
			FLOOR SPACE				EQUIPMENT													
(FROM COLUMN 9)	⑱ NUMBER OF TEACHING UNITS	ANNUAL OPERATING COST (COL. 24 × AVERAGE TEACHER SALARY +30% OVERHEAD)	⑱ INSTRUCTIONAL FLOOR SPACE (SQ. FT.)	INSTRUCTIONAL & ARCHITECTURAL FLOOR SPACE (COL. 26 × "A").	FLOOR SPACE COST (COL. 27 × "B")	ANNUAL FLOOR SPACE COST (COL. 28 ÷ "C")	INSTRUCTIONAL EQUIPMENT COST ⑱ ㉓	ANNUAL INSTRUCTIONAL EQUIPMENT COST (COL. 30 ÷ "D")	TOTAL ANNUAL RESOURCES COST (COL. 25 + COL. 29 + COL. 31)	PROPOSED FULL TIME ENROLLMENT (FROM COL. 20)	TOTAL ANNUAL RESOURCES COST PER STUDENT (COL. 32 ÷ COL. 33)	RATING OF SOCIO-ECONOMIC VALUE (FROM COL. 15)	RATING OF RESOURCES COST PER STUDENT (USE COL. 34)	VALUE RATING ÷ COST RATING (COL. 35 ÷ COL. 36)	COURSE CAPABILITY OF MEETING JOB REQUIREMENTS	㉑ ㉒ FUNDING AVAILABILITY	OCCUPATION & COURSE ATTRACTIVENESS TO STUDENTS		TOTAL RATING	FINAL SELECTION
5	1	10400	2400	3000	75000	3750	20000	2000	16150	40	403	10	* 9	1	8	7	5		40	X
												10	10	1	8	7	8		44	
												10	10	1	10	3	7		41	X
												10	2	5	9	8	9		43	X
6				See Recommendation (B)								10	7	1	7	7	9		41	
												10	2	5	9	8	9		43	X
6												11	4	2	6	7	8		38	X
	1	10400	2520	3150	78750	3937	18000	1800	16137	40	403	11	9	1	7	7	9		44	X
												11	9	1	7	7	8		43	
8				Supply from A. E. Depts. of Comprehensive H. S. and College Extension Courses.								17	6	3	6	8	6		46	X
												17	3	6	8	6	5		45	X

*(HIGH COST GIVES A LOW RATING)

COMMUNITY AREA: Cumberland-Perry Co's PREPARED BY: Robert T. Stoner DATE: 3/14/69

PROGRAM SUMMARY -- VOCATIONAL AND TE

LINE NUMBER (FROM FORM 4)	COLUMN → 44	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
	COLUMN TITLES: → (FOR EXISTING AND PROPOSED PROGRAMS) • SCHOOL TYPES • SCHOOL NAMES • TRAINING MEDIUMS (INSET) IN COLUMNS FOLLOWING. DATA IN EACH LINE: • ANNUAL ENROLLMENT--EXISTING/PROPOSED • PREPARATORY (P) OR SUPPLEMENTARY (S)	COLL. OR UNIV.	Pa. State Univ.	Conference Series	COMMUNITY COLL.	Harrisburg Area C.C.	Full Time Day	P.T. Day or Even		POST SECONDARY	Pa. State-York Center	Full Time Day	P.T. Day or Even		COMPREHENSIVE H.S.	16-Cumberland-Perry	Secondary Day
	COURSE PROPOSED AND/OR OCCUPATIONAL FIELD																
14	Typist & Gen. Clerical																448
11	Secretary's & Steno. Secretarial Science						35										436
15	Merchandising Sales Workers																N.A.
19	Foods Preparation & Serv Quantity Foods Occupt.																
23	Auto Engine Mechanics																
32	Machine Shop Practice																34
37	Plumbers & Pipe Fitters																
1	Civil Technology						20					23					
2	Drafting & Design Tech.						36										
8	Farmers & Farm Workers Agriculture Education			N.A.													25
	TOTAL →																

N.A. = Not available

FEB. 15, 1969

CHNICAL EDUCATION BLOCK ㉑ "SYNTHESIS" --REFER TO CHART 3 (SHEET 1 OF 2) FORM 5

Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF	45	46	47	48
Part-time Even.	Carlisle H.S.	Secondary Day	Part-Time Even.		AREA VOC. TECH. SCH.	Cumberland-Perry Area Tech.	(Shared Time)	Secondary Day	Part-Time Coop.	Part-Time Even.						ANNUAL PREPARATORY ENROLLMENT -- EXISTING	ANNUAL PREPARATORY ENROLLMENT -- PROPOSED	ESTIMATED ANNUAL ENTRANTS INTO LABOR FORCE (COL. 22)	UNMET NEED COL. 7 - COL. 47
																See	Sheet	2	
			N.A.													See	Sheet	2	
								40	10							-	50	30	296
								40	10	N.A.						--	50	30	440
		28						40		N.A.						28	40	22	35
								40	20	N.A.						See	Sheet	2	
								40								See	Sheet	2	
																43	--	21	5
								40								36	40	31	5
																259	--	80	71

COMMUNITY AREA: Cumberland-Perry Co's. SUBMITTED BY: Robert T. Stoner DATE: 3/14/69

PENNA. VOC. ED. STUDY - 1968/9.

PROGRAM SUMMARY - - VOCATIONAL AND TEC

LINE NUMBER (FROM FORM 4)	COLUMN → 44	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
	COLUMN TITLES: → (FOR EXISTING AND PROPOSED PROGRAMS) • SCHOOL TYPES • SCHOOL NAMES • TRAINING MEDIUMS (INSET) IN COLUMNS FOLLOWING. **DATA IN EACH LINE:** • ANNUAL ENROLLMENT--EXISTING/PROPOSED • PREPARATORY (P) OR SUPPLEMENTARY (S) **COURSE PROPOSED AND/OR OCCUPATIONAL FIELD**	PRIVATE POST SEC.	Central Penn Bus.	P.T. Day or Even.	Thompson Inst.	P.T. Day or Even.	Hbg. Med. Arts	P.T. Day or Even.		INDUSTRY IN-PLANT	(Employer's Name)	Apprenticeship	Vestibule	On-The-Job			
14	Typist & Gen. Clerical			55		51											
11	Secretary's & Steno. Secretarial Science			35		35		N.A.									
15	Merchandising Sales Workers																
19	Foods Preparation & Serv Quantity Foods Occupt.																
23	Auto Engine Mechanics													N.A.			
32	Machine Shop Practice											8	N.A.				
37	Plumbers & Pipe Fitters											N.A.					
1	Civil Technology																
2	Drafting & Design Tech.																
8	Farmers & Farm Workers Agriculture Education																
	TOTAL →																

N.A. = Not available

FEB. 15, 1969

HNICAL EDUCATION BLOCK ㉑ "SYNTHESIS" --REFER TO CHART 3 (SHEET 2 OF 2) **FORM 5**

Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF	45	46	47	48
																ANNUAL PREPARATORY ENROLLMENT -- EXISTING	ANNUAL PREPARATORY ENROLLMENT -- PROPOSED	ESTIMATED ANNUAL ENTRANTS INTO LABOR FORCE (COL. 22)	UNMET NEED COL. 7 - COL. 47
																554	--	282	166
																541	--	244	-11
																42	60	47	2
																--	40	13	12

COMMUNITY AREA: Cumberland-Perry Co's. SUBMITTED BY: Robert T. Stoner DATE: 3/14/69

Benefits Derived from Systematic Long Range Planning

1. Identification of all manpower demands and needs in the State and local areas.

2. Assists in determining and justifying appropriate schools and programs required to meet established needs.

3. Assists in determining the extent and cost of required schools and programs.

4. Helps to avoid wasteful overlapping and unnecessary duplication of effort and cost.

5. Develops close working relationships with other major governmental agencies, State and local, e.g. Department of Labor and Industry, Department of Commerce, State Planning Board, Department of Community Affairs, Local and Regional Industrial Development Commissions.

6. Develops close working relationships with State and local industrial development leaders and employers.

7. Assists in redirecting the State program toward meeting the priority or more critical needs of people and employers.

Organizational Requirements

Obviously, the Systems procedure would require a sharp change in State organization and administration of vocational, technical and continuing education; an extensive in-service training of all State staff personnel; and an extensive pre-service and in-service training of local administrative and supervisory personnel and teacher educators. In addition, there would be required close working relationships and coordination with all State and local education agencies and with other State and local governmental agencies, especially those concerned with economic and industrial growth and development.

Planning Steps and Financial Aid Policies

A treatment of State level program planning under P.L. 90-576 can hardly be complete without some consideration of financial aid policies. In general, the existing financial aid policies and procedures in many States may have two serious shortcomings (1) they may not permit management of funds in the best interests of meeting critical needs and deamnds and (2) they probably will not be consistent with the requirements of the Vocational Education Amendments of 1968.

Percentages of total Federal Grant (Part B), and State funds might be fixed in advance to give emphasis to critical needs and to conform to minimum expenditure requirements of P.L. 90-576, e.g.

(a)	Secondary Programs	15%
(b)	Postsecondary Programs (Mandated) (Public and Private)	15%
(c)	Adult Programs	12%
(d)	Special Needs of Disadvantaged (Mandated)	15%
(e)	Handicapped (Mandated)	10%
(f)	Construction	20%
(g)	Vocational Guidance and Counseling	5%
(h)	Private School Programs	3%
(i)	Ancillary Services and Activities	5%
		100%

It would be desirable from a management standpoint for the State administration to have the authority to adapt the variables in the funding policies and procedures annually so that the direction and configuration of the State's vocational education program could be influenced as required to accomplish the purposes of the new act. This would enable the administration to establish objectives that reflect the best interests of the people and to encourage activities that increase the possibility of achieving those objectives.

New aid policies will need to be measured now and later in terms of forthcoming requirements of new rules and regulations governing P.L. 90-576. For example, Section 123 (a) (6) (E) states, "funds will not be allocated to local eduational agencies in a manner, such as the matching of local expenditures at a percentage ratio uniform throughout the State, which fails to take in consideration" the results of evaluations, the relative vocational education needs of all population groups in all parts of the State, especially the socio-economic disadvantaged, the relative ability of the local educational agency to provide the resources and the excess of the cost of vocational education programs, services and activities.

There are several considerations that might be considered as fundamental and vital to all financial aid policies and procedures:

(1) The Federal and State funds should be used to the maximum as incentives to local educational agencies to help expand and improve the program in the direction of the purposes of the Federal and State Acts. These purposes are presumed to reflect, in general, nationally and in all States, the demands and needs of people as well as those of employers.

(2) Financial Aid policies should be thoroughly reviewed with the consultation and advice of involved persons and agencies and revised annually, if necessary, to accomplish the purposes and objectives of the programs.

(3) The policies should be decided upon by the State Board for Vocational Education as early as possible in the Spring of each year well in advance of a new fiscal and school year.

(4) After formal State Board approval is recorded in the minutes of an official meeting, the policies should be reproduced and distributed to all concerned school administrators well in advance so that they can take them into consideration in preparing their program plans and budgets.

(5) The aid policies should be based on fair and equitable distribution of funds not necessarily uniformly, but taking into account the ability of local educational agencies to finance a program and other consideration specified in P.L. 90-576.

The following are some suggested approaches which tie together planning steps and financial aid policies and procedures:

1. Determine the annual labor market needs of the State and local areas for the next five years.

2. Ascertain the total supply of occupationally trained graduates likely to be produced annually that five-year period.

3. Evaluate the compatibility of graduate supply and labor market demand.

4. Note the occupational fields where additional growth should be encouraged and those where program outputs might be somewhat curtailed.

5. Establish a priority listing of critical needs of the State and each local area.

6. Devise a formula that will consider the various needs established in No. 5 in an effort to allocate available funds, for example:

Use the several factors specified in P.L. 90-576, weigh the factors to suit the State's measurement and judgment of its needs and calculate an index figure on the basis of 100. Then allot the available funds to local educational agencies pro rata on approved local program plans. Analysis of P.L.90-576 suggests or requires the following major factors to be taken into consideration in determining aid policies:

(a) Annual and Five Year, State-wide and Local, Job Opportunities and Manpower Training Needs by Census Job Classifications.

(b) Reliability of Program Planning Procedures and the Proposed Program Plan

1. Use of manpower and economic data and information obtained through cooperative arrangements

2. Costs in excess of normal educational costs

3. Program evaluation results and their uses

(c) Needs of All the Population Groups

1. The Young
2. The Aging
3. The Handicapped
4. The Disadvantaged
5. The Unemployed
6. The Underemployed
7. The Poor (median income not more than 40% of the national median)
8. Public Assistance Clients

(d) Relative Ability to Pay, Tax Effort and Economic Level of Area

1. Local revenue and local wealth, e.g. amount of taxes collected annually per $1000 of income

2. Total annual revenues for education per total wealth

3. Economically Depressed or High Unemployment Areas

Determination can be by Department of Commerce as Redevelopment Area (Section 401 Work and Economic Development Act.)

Each of the above four major factors could be rated on a developed scale of 1 to 25. Other weightings could be adopted to suit State judgment and needs. One hundred would be the maximum index possible. Even though subjective judgments were used, this method could provide for a reasonably equitable distribution of available funds.

7. Assist the local districts in developing and submitting a proposal that will bring the existing program configuration into line with the priorities established in No. 5 above.

8. Review the proposal and if it complies with the priorities, approve it and encumber the funds allotted by the formula.

9. On a specified date, reallocate by formula the unencumbered funds, repeat steps 7 and 8, and, if the funds still have not been exhausted, apply the remainder to special projects consistent with the priorities. They could also be used to further assist less wealthy districts in achieving their goals.

10. The next year or whenever events dictate, a review of the priorities should be accomplished and changes made as necessary. Smooth transitions would be considered.

11. The formula variables would be adjusted accordingly and the cycle restarted.

The fundamental basis of all of these processes is organized systematic State-wide planning, taking into account many local considerations. Much more aggressive State leadership along with considerable interaction with local educational agencies and institutions will be required. In turn, this kind of State-local interaction will necessarily involve close working relationships with other appropriate State and local agencies and employers in every community.

Only in this way, is it likely that all of the States will provide training opportunities readily accessible to all persons of all ages in all communities of the State.

System Planning and Evaluation

Although it is not within the scope of this study to design an evaluation planning procedure, some discussion of this subject is appropriate since system planning must be conducted with considerable thought on how the system in operation is to be evaluated. When the system planning is oriented towards the end product (System operation and evaluation), the need for precise objectives, measurable goals, and appropriate selection criteria is emphasized. The relationship between systems planning, evaluation planning, and the subsequent operations evaluation, is depicted in Chart 4.

The first column on the chart shows the sequence of major steps involved at the three levels of systems planning. The second column describes some of the typical evaluation planning work. As the systems planning is accomplished at each successive level, information is generated which is used in the evaluation planning. This flow of planning information is indicated by the slanting arrows running from left to right. For example, in the trade-off and synthesis steps of the Socio-Economic Cycle (level 1), potential new industries for economic development in a local area are selected. Also arrangements may be made between the local area and new industries to supply trained manpower. This economic planning information is used in the design of surveys to measure the effect of the resulting vocational education programs on the new industries and the community.

The surveys, designed at level 1, are further developed in the Vocational Education Planning Cycle (level 2) in which the occupational training needs of existing industries are determined. In other words, the evaluation planning work is a cumulative process, so that as additional information becomes available in the course of the system planning, it is used to expand the work already done in the evaluation planning. This growth of the evaluation design, consisting of surveys, tests and studies, is represented on the chart by the heavy downward arrows.

Most of the tasks involved in the evaluation planning cannot be completed until the work at the Resources Planning cycle (level 3) has been completed. For example, the design of industry surveys regarding the performance of students on the job cannot be completed until the resources to be applied in the training of the students have been defined. It is necessary to know not only how well the new employees are doing, but how well they are doing relative to the training resources which were applied -- such as teachers, facilities, equipment, time and money.

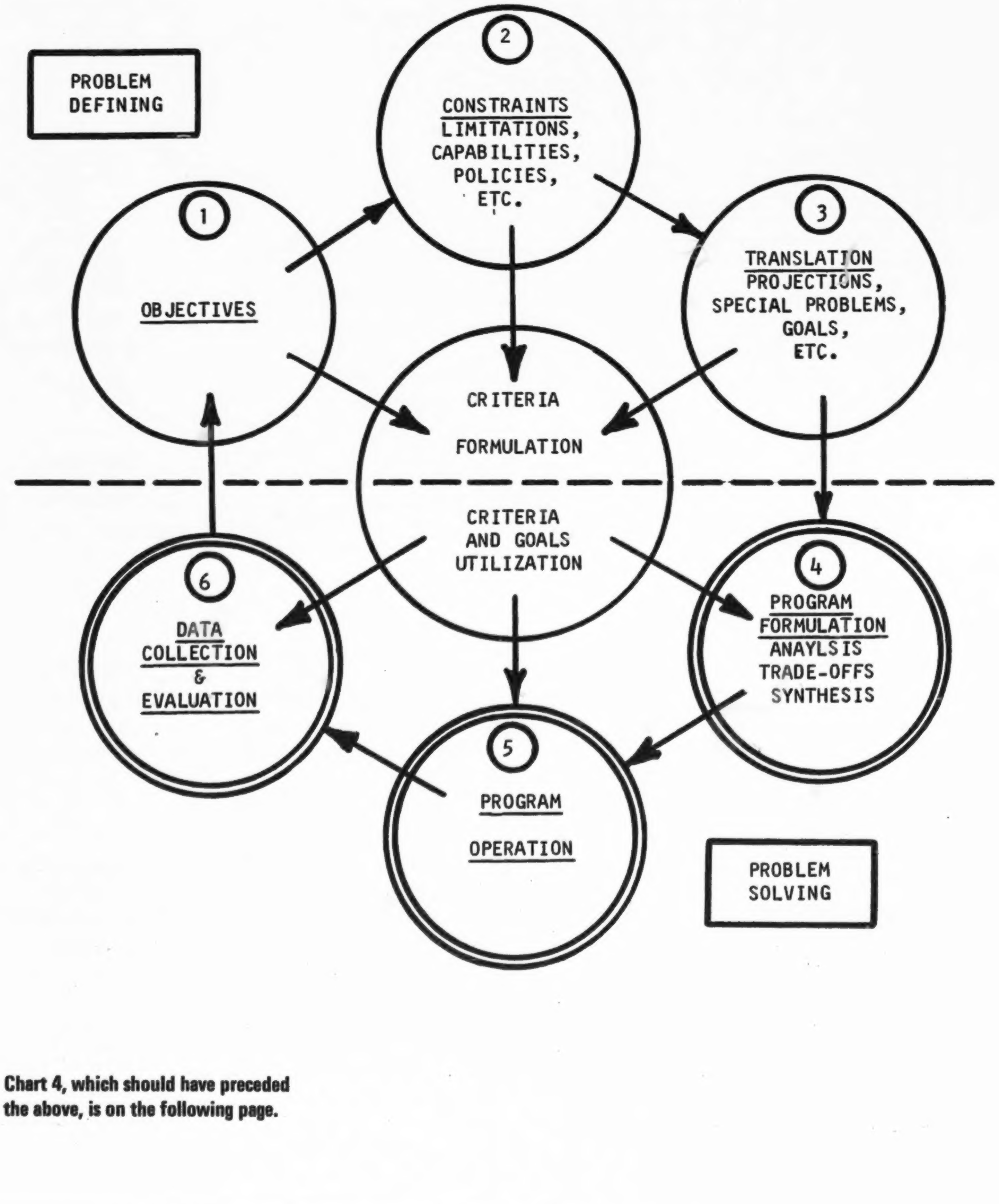
The third column on the chart shows the upward flow of operating data, which was prescribed during the evaluation planning process. The comparison of this data with the present goals constitutes the principal task in the evaluation of the system. Another task is to determine if the most appropriate selection criteria were used in the system planning, and if the data used to determine the criteria ratings (such as shown in Form 1 and 3) were an accurate representation of the problem environment relative to decision-making.

The evaluation process usually results in the making of new decisions, as shown on the top of the chart, which effect both the future system planning and the evaluation planning. Thus the complete program management process is a continuous cycle of activities, consisting of system planning, evaluation planning, program operation, data collection, and evaluation. This cycle is repeated when new policies and environmental conditions, i.e., the "constraints", cause the problem to be restated and its solution replanned.

The emphasis in the "systems approach" concept of program management is on logical decision-making. Since all (logical) decisions are made by the conscious use of criteria, or "standards of judgment", a great deal of attention must be given to their formulation and utilization throughout the program management cycle. The role of criteria, as the hub of all activities, is illustrated in Chart 5. In the program-defining activities of the cycle, the criteria are formulated; in the problem-solving activities, they are used to make decisions and later (along with the goals) they are used to evaluate the results of the decisions.

CHART 5 *

THE ROLE OF CRITERIA IN THE PROGRAM MANAGEMENT CYCLE

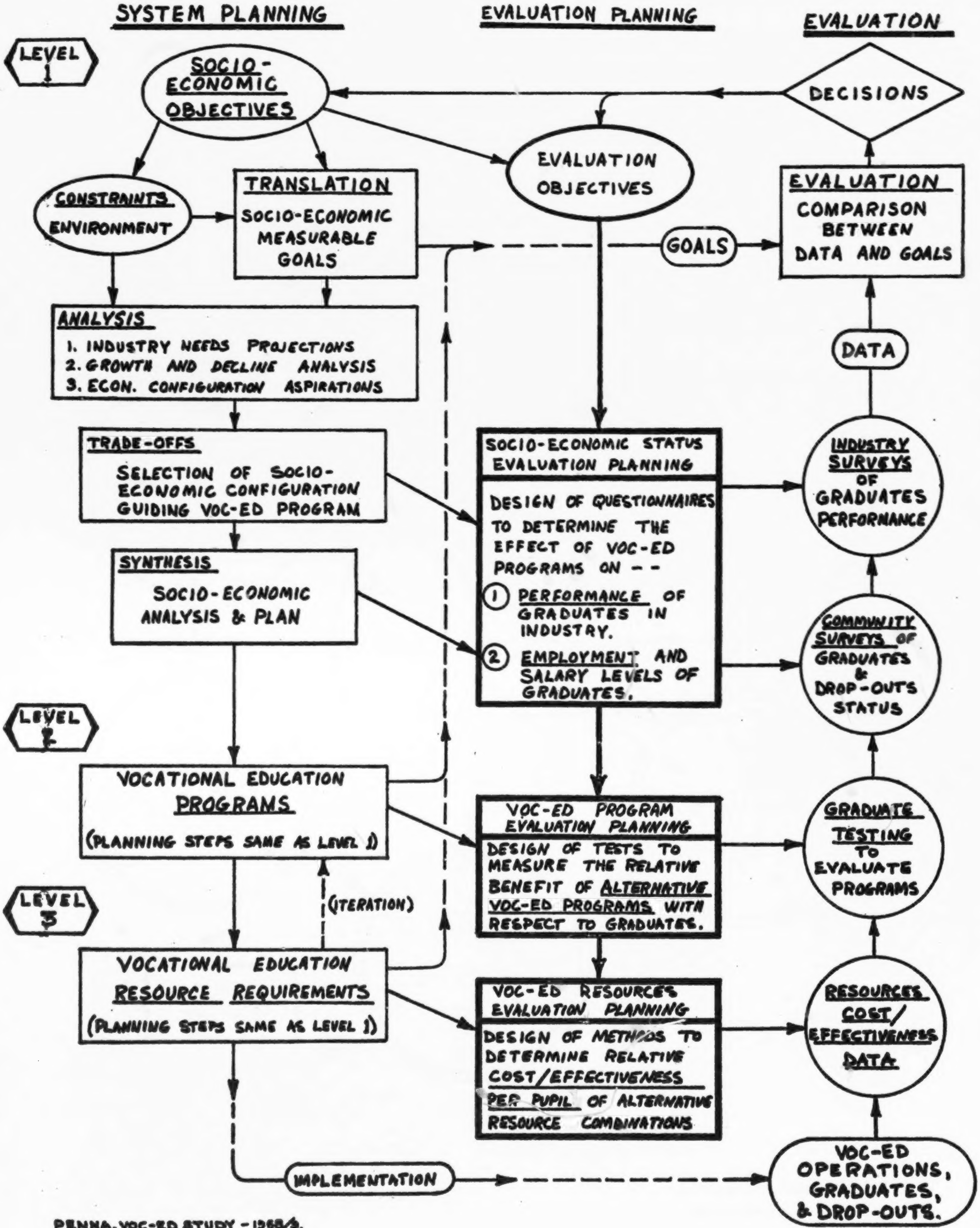

PROBLEM DEFINING
2
CONSTRAINTS
LIMITATIONS,
CAPABILITIES,
POLICIES,
ETC.
1
OBJECTIVES
3
TRANSLATION
PROJECTIONS,
SPECIAL PROBLEMS,
GOALS,
ETC.
CRITERIA
FORMULATION
CRITERIA
AND GOALS
UTILIZATION
6
DATA
COLLECTION
&
EVALUATION
4
PROGRAM
FORMULATION
ANAYLSIS
TRADE-OFFS
SYNTHESIS
5
PROGRAM
OPERATION
PROBLEM
SOLVING

---

* **Chart 4, which should have preceded the above, is on the following page.**

CHART 4

VOCATIONAL EDUCATION SYSTEM PLANNING AND EVALUATION


SYSTEM PLANNING
EVALUATION PLANNING
EVALUATION
LEVEL 1
SOCIO-ECONOMIC OBJECTIVES
DECISIONS
CONSTRAINTS ENVIRONMENT
TRANSLATION SOCIO-ECONOMIC MEASURABLE GOALS
EVALUATION OBJECTIVES
EVALUATION COMPARISON BETWEEN DATA AND GOALS
GOALS
ANALYSIS
1. INDUSTRY NEEDS PROJECTIONS
2. GROWTH AND DECLINE ANALYSIS
3. ECON. CONFIGURATION ASPIRATIONS
DATA
TRADE-OFFS SELECTION OF SOCIO-ECONOMIC CONFIGURATION GUIDING VOC-ED PROGRAM
SOCIO-ECONOMIC STATUS EVALUATION PLANNING
DESIGN OF QUESTIONNAIRES TO DETERMINE THE EFFECT OF VOC-ED PROGRAMS ON --
① PERFORMANCE OF GRADUATES IN INDUSTRY.
② EMPLOYMENT AND SALARY LEVELS OF GRADUATES.
INDUSTRY SURVEYS OF GRADUATES PERFORMANCE
SYNTHESIS SOCIO-ECONOMIC ANALYSIS & PLAN
COMMUNITY SURVEYS OF GRADUATES & DROP-OUTS STATUS
LEVEL 2
VOCATIONAL EDUCATION PROGRAMS (PLANNING STEPS SAME AS LEVEL 1)
VOC-ED PROGRAM EVALUATION PLANNING
DESIGN OF TESTS TO MEASURE THE RELATIVE BENEFIT OF ALTERNATIVE VOC-ED PROGRAMS WITH RESPECT TO GRADUATES.
GRADUATE TESTING TO EVALUATE PROGRAMS
LEVEL 3
(ITERATION)
VOCATIONAL EDUCATION RESOURCE REQUIREMENTS (PLANNING STEPS SAME AS LEVEL 1)
VOC-ED RESOURCES EVALUATION PLANNING
DESIGN OF METHODS TO DETERMINE RELATIVE COST/EFFECTIVENESS PER PUPIL OF ALTERNATIVE RESOURCE COMBINATIONS
RESOURCES COST/ EFFECTIVENESS DATA
IMPLEMENTATION
VOC-ED OPERATIONS, GRADUATES, & DROP-OUTS.

PENNA. VOC-ED STUDY - 1968/9.

R.S.M.

APPENDIX

RELATIONSHIP OF MANPOWER SUPPLY AND DEMAND IN PENNSYLVANIA

ANNUAL OUTPUT OF ALL
MAJOR TRAINING AGENCIES
FOUR TABLES

ANNUAL MANPOWER PROJECTIONS
OF DEMANDS AND NEEDS TO 1975
STATEWIDE

ANNUAL MANPOWER PROJECTIONS
OF DEMANDS AND NEEDS TO 1975
CUMBERLAND AND PERRY COUNTIES

RELATIONSHIP OF MANPOWER SUPPLY AND DEMAND

Annual Output of All Major Training Agencies

A very important factor in total program planning is the matter of sources and quantity of the supply of trained personnel. Such data is a useful measure in determining the present status of occupational education in Pennsylvania. Perhaps more important, it is essential in the process of determining the net training needs of the State. When the annual supply is known, these data can be applied to the total annual demand and at least a reasonably close estimate can be made of the unmet needs each year. Obviously, this provides one quantitative measure of program attainment each year.

This study undertook to identify the principal sources of supply, namely, the organized non-professional occupational education and training institutions and agencies. Nine of these were contacted to obtain their output of graduates in 1967. Other agencies that contribute a small number of trained entrants into the labor force are not included in this summary. This study did not undertake to get similar data on baccalaureate or advanced degree graduates of professional schools. Neither did the study attempt to study other sources or causes of new entrants into given occupational classifications.

The data presented in Tables I, II, III and IV summarize the information gathered from the occupational training institutions in Pennsylvania. The occupational categories in the tables are the major groupings of occupations as found in the U.S. Census. The totals represent a summation of the numerous occupations within the category. The use of these U.S. Census occupational groupings makes the data compatible with the labor force demand figures.

Table I indicates the number of graduates of each institution or agency to each occupational category. The numbers represent those graduates who were trained for initial placement in entry level positions in their chosen occupation. Adult and supplemental training are not reported in this data as these people were deemed to be already in the labor force. It should be noted that the numbers in public secondary school and several of the state trade and technical schools represent 12th grade graduates. The number in the remaining columns represent post secondary graduates.

It is essential that each chart be interpreted correctly. The figures in the horizontal and vertical columns outside the respective double lines (Tables II, III, IV) represent a percentage of the total number of graduates. It is the internal portion of Table II and III that contains the significant figures for interpretive purposes. However, the total picture is understandable only when Tables II and III are analyzed in conjunction with Table IV.

TABLE I
DISTRIBUTION OF 1967 GRADUATES BY TYPE OF INSTITUTION AND OCCUPATIONAL CATEGORY

OCCUPATIONAL CATEGORY	TYPE OF INSTITUTION									TOTAL CONTRIBUTION BY OCCUPATIONAL TYPE
	PUBLIC SECONDARY SCHOOLS	COMM. COLLEGES	PRIVATE TRADE SCHOOLS	PRIVATE BUSINESS SCHOOLS	STATE TRADE AND TECH. SCHOOLS	MDTA	STATE RETRAINING ACT	2-YR. PROGRAMS IN 4-YR. SCHOOLS	PRIVATE COLLEGES	
PROFESSIONAL, TECHNICAL AND KINDRED WORKERS	1968	232	1999	40	63	351	37	1068	189	5947
FARMERS AND FARM WORKERS	948	---	---	---	2	55	---	---	---	1005
MANAGERS, OFFICIALS AND PROPRIETORS (incl. farm)	1104	---	19	392	---	---	70	615	485	2685
CLERICAL AND KINDRED WORKERS	34282	374	444	7930	314	359	---	52	538	44293
SALES WORKERS	2687	7	390	187	---	55	---	---	---	3326
CRAFTSMEN, FOREMAN AND KINDRED WORKERS	5126	288	2350	---	232	1547	737	---	---	10280
OPERATIVES AND KINDRED WORKERS	349	---	286	---	17	899	3165	129	---	4845
SERVICE WORKERS	1927	52	547	---	17	1018	---	---	---	3561
TOTAL CONTRIBUTION BY TYPES OF INSTITUTION	48391	953	6035	8549	645	4284	4009	1864	1212	75942

TABLE II
PERCENT OF GRADUATES IN EACH OCCUPATIONAL CATEGORY CONTRIBUTED BY EACH TYPE OF INSTITUTION

OCCUPATIONAL CATEGORY	TYPE OF INSTITUTION									TOTAL CONTRIBUTION BY OCCUPATIONAL TYPE
	PUBLIC SECONDARY SCHOOLS	COMM. COLLEGES	PRIVATE TRADE SCHOOLS	PRIVATE BUSINESS SCHOOLS	STATE TRADE AND TECH. SCHOOLS	MDTA	STATE RETRAINING ACT	2-YR. PROGRAMS IN 4-YR. SCHOOLS	PRIVATE COLLEGES	
PROFESSIONAL, TECHNICAL AND KINDRED WORKERS	33.1	3.9	33.6	0.7	1.1	5.9	0.6	17.9	3.2	100.0
FARMERS AND FARM WORKERS	94.3	---	---	---	0.2	5.5	---	---	---	100.0
MANAGERS, OFFICIALS AND PROPRIETORS (incl. farm)	41.1	---	0.7	14.6	---	---	2.6	23.0	18.0	100.0
CLERICAL AND KINDRED WORKERS	77.4	0.8	1.0	17.9	0.7	0.8	---	0.2	1.2	100.0
SALES WORKERS	80.8	0.2	11.7	5.6	---	1.7	---	---	---	100.0
CRAFTSMEN, FOREMAN AND KINDRED WORKERS	49.8	2.8	22.9	---	2.3	15.0	7.2	---	---	100.0
OPERATIVES AND KINDRED WORKERS	7.2	---	5.9	---	0.4	18.5	65.3	2.7	---	100.0
SERVICE WORKERS	54.1	1.4	15.4	---	.5	28.6	---	---	---	100.0
TOTAL CONTRIBUTION BY TYPES OF INSTITUTION	63.8	1.3	7.8	11.3	0.8	5.7	5.3	2.5	1.5	100.0

TABLE III
PERCENT OF 1967 INSTITUTION GRADUATES IN EACH OCCUPATIONAL CATEGORY

OCCUPATIONAL CATEGORY	TYPE OF INSTITUTION									TOTAL CONTRIBUTION BY OCCUPATIONAL TYPE
	PUBLIC SECONDARY SCHOOLS	COMM. COLLEGES	PRIVATE TRADE SCHOOLS	PRIVATE BUSINESS SCHOOLS	STATE TRADE AND TECH. SCHOOLS	MDTA	STATE RETRAINING ACT	2-YR. PROGRAMS IN 4-YR. SCHOOLS	PRIVATE COLLEGES	
PROFESSIONAL, TECHNICAL AND KINDRED WORKERS	4.1	24.3	33.1	0.5	9.8	8.2	0.9	57.3	15.6	7.8
FARMERS AND FARM WORKERS	2.0	---	---	---	0.3	1.3	---	---	---	1.4
MANAGERS, OFFICIALS AND PROPRIETORS (incl. farm)	2.3	---	0.3	4.6	---	---	1.8	33.0	40.0	3.5
CLERICAL AND KINDRED WORKERS	70.8	39.2	7.4	92.7	48.7	8.4	---	2.8	44.4	58.3
SALES WORKERS	5.6	0.7	6.5	2.2	---	1.3	---	---	---	4.4
CRAFTSMEN, FOREMAN AND KINDRED WORKERS	10.5	30.2	38.9	---	35.9	36.1	18.4	---	---	13.5
OPERATIVES AND KINDRED WORKERS	0.7	---	4.7	---	2.6	20.9	78.9	6.9	---	6.5
SERVICE WORKERS	4.0	5.6	9.1	---	2.7	23.8	---	---	---	4.6
TOTAL CONTRIBUTION BY TYPES OF INSTITUTION	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

TABLE IV
PERCENT OF TOTAL 1967 GRADUATES OF ALL INSTITUTIONS CONTRIBUTED BY EACH TYPE OF INSTITUTION TO EACH OCCUPATIONAL SUB-CATEGORY

OCCUPATIONAL CATEGORY	TYPE OF INSTITUTION									TOTAL CONTRIBUTION BY OCCUPATIONAL TYPE
	PUBLIC SECONDARY SCHOOLS	COMM. COLLEGES	PRIVATE TRADE SCHOOLS	PRIVATE BUSINESS SCHOOLS	STATE TRADE AND TECH. SCHOOLS	MDTA	STATE RETRAINING ACT	2-YR. PROGRAMS IN 4-YR. SCHOOLS	PRIVATE COLLEGES	
PROFESSIONAL, TECHNICAL AND KINDRED WORKERS	2.6	0.3	2.6	0.1	0.1	0.5	---	1.4	0.2	7.8
FARMERS AND FARM WORKERS	1.3	---	---	---	---	0.1	---	---	---	1.4
MANAGERS, OFFICIALS AND PROPRIETORS (incl. farm)	1.5	---	---	0.5	---	---	0.1	0.8	0.6	3.5
CLERICAL AND KINDRED WORKERS	45.1	0.5	0.6	10.4	0.4	0.5	---	0.1	0.7	58.3
SALES WORKERS	3.5	---	0.5	0.3	---	0.1	---	---	---	4.4
CRAFTSMEN, FOREMAN AND KINDRED WORKERS	6.8	0.4	3.0	---	0.3	2.0	1.0	---	---	13.5
OPERATIVES AND KINDRED WORKERS	.5	---	0.4	---	---	1.2	4.2	0.2	---	6.5
SERVICE WORKERS	2.5	0.1	0.7	---	---	1.3	---	---	---	4.6
TOTAL CONTRIBUTION BY TYPES OF INSTITUTION	63.8	1.3	7.8	11.3	0.8	5.7	5.3	2.5	1.5	100.00

RELATIONSHIP OF MANPOWER SUPPLY AND DEMAND

Annual Manpower Projections of DEMANDS AND NEEDS TO 1975

An important facet of the Pennsylvania Study on Vocational Education is the development of a statistical base to determine the extent to which the present occupational education programs are meeting manpower needs. The fact that no single acceptable methodology existed or that attempts made were severely criticized does not diminish the need for a fairly reliable statistical base of manpower supply and demand upon which to evaluate and plan vocational education programs.

This manpower and training data for Pennsylvania is therefore a breakthrough of considerable significance. The input of employed workers for 1960 was taken from the U.S. Census of that year and the projections to 1975 were made by the Bureau of Employment Security in the Pennsylvania Department of Labor and Industry. Withdrawal, growth and supply data relative thereto were produced within the Department of Public Instruction's Vocational Education Research Coordinating Unit. The theory and mathematical development of this procedure is not beyond constructive critical observation. However, continuous improvement can be anticipated by the input of 1970 census data and re-evaluation of withdrawal, growth and supply data relevant to the year of that input.

It can now be stated with considerable confidence that in 1975 Pennsylvania will have 5,000,000 persons gainfully employed; that 192,000 persons will withdraw from the labor force each year; that 66,000 new job openings will occur each year; that 259,000 job vacancies will exist annually; and that formal occupational education programs excluding college and university output, except produced only 75,000 persons in 1967 to meet these job vacancies. For the first time too, attention can be directed to specific occupations for which the educational programs of the State appear to be producing a supply of new job entrants in excess of the demands of the labor market.

The Research Coordinating Unit has computerized similar manpower projection data for every county of the State. The State summary provides the base for professional judgments which will produce recommendations to the State Board in regard to training and the allocation of funds to implement a more efficient Statewide program. The county data will localize problems and suggest possible program directions and promote local initiative in creating or expanding training facilities. One should not conclude that the Area Vocational-Technical School concept is the only solution. Especially in cases where the AVTS has not as yet been established, other types of vocational and technical education programs must be fully considered. Candidate solutions should be identified in each local area involved by giving consideration to all types of schools and all possible mediums of instruction. (Illustrated on Form 4)

For example, observe on Table II that 94.3% of the total Farmers and Farm Workers are trained in the Public Secondary Schools. But note on Table III that this category accounts for only 2.0% of the Secondary Schools' occupational education graduates. To continue the comparison it can be seen on Table IV that the Farmers and Farm Workers category accounts for only 1.3% of all occupational graduates.

Similar comparisons can be made in the other categories. Comparisons of this type give a gross indication of the present occupational education program emphasis in Pennsylvania. More significant information for the local program planner is the county data used to obtain the figures in these tables. How county supply data is utilized in program planning is presented in an example later in this report.

Some Highlights of the Supply Data

(1) Less than 25% of the total annual demand (259,150) is met by the output of the nine major training institutions and agencies.

(2) The public secondary vocational education programs provide approximately 64% (48,391 of 75,942) of the total supply. However, 71% of these graduates are in the office occupations.

(3) Less than one-third of the annual demand for highly skilled technicians is supplied by all the agencies and institutions.

(4) The private business, trade and technical schools provide 19% of the total number of graduates produced.

PENNSYLVANIA MANPOWER AND TRAINING DATA

The 1960 U.S. Census data for Pennsylvania were projected to 1975 with annual withdrawal, growth, demand, supply and need by census job classifications related to preparatory curriculums during the period 1967-1968. Updated projections will be prepared in each subsequent year.

Note 1: Projections of 1960 census data to 1975 by occupational classifications were made by the Pennsylvania Department of Labor and Industry, Bureau of Employment Security, Research and Statistics Division, Harrisburg, Pennsylvania.

Note 2: Projections of withdrawal, growth, demand, supply and need data from the basic occupational density for 1960 or 1975 were made by the Pennsylvania Department of Public Instruction, Bureau of Research, Research Coordinating Unit.

Note 3: Similar data on manpower and training were prepared during the period 1967-1968 for every county in Pennsylvania for use in county Vocational, Technical and Continuing Education program planning. Twenty-four counties exceeding 100,000 population have 164 occupational classifications projected to a 1975 employment level; seven counties have 63 occupational classifications also projected to a 1975 employment level; the remaining 36 sparsely populated counties list 63 occupational classifications based on the 1960 census data. Updated projections will be prepared for every county in each subsequent year.

Note 4: In the ten classifications of Technical Engineers, the annual demand and supply figures represent highly skilled technicians as supporting personnel to engineers on the basis of an assumed 1 to 1 ratio of supporting technicians to engineers. The present actual ratio has been reported by the National Science Foundation as approximately .75 to 1.

Note 5: The annual supply figures for the professions were not obtained for this study; therefore, the annual need figures are not recorded for the professions on this form.

Note 6: The supply figure of 205 nurses represents only the associate degree nurses graduated in 1967. The 1967 supply of diploma and baccalaureate degree nurses were not obtained for this report.

Note 7: A description of objectives, use, methodology, and accuracy variability as applied to this manpower data is described in the final report.

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Department of Public Instruction
Research Coordinating Unit
for Vocational Education

PENNSYLVANIA MANPOWER AND TRAINING DATA

STATE-WIDE TOTALS

DOT CODE	Occupational Classification	Census 1960 (1)	Projected Employment 1975 (2)	Annual With-Drawal (3)	Annual Growth (4)	Annual Demand (5)	Annual Supply (6)	Annual Need (7)	Penna. Code	Preparatory Curriculum
	GRAND TOTAL	4,127,208	5,022,000	192,595	66,561	259,150	75,942	161,405		
450	PROFESSIONAL, TECHNICAL & KINDRED WORKERS	441,149	710,500	21,219	28,849	50,068	5,947	20,930		
451	Engineers, Technical	53,750	96,200	2,405	3,848	6,253	616	5,637		
002	Engineers, Aeronautical	723	900	22	36	58	5	53	102	Aeron. Technology
	Engineers, Chemical	3,065	4,900	122	205	327	63	264	152	Chemical Technology
005	Engineers, Civil	7,713	12,900	326	516	842	110	732	153	Civil Technology
003	Engineers, Electrical	11,016	20,800	520	804	1,324	170	1,154	154	Elect. Technology
012	Engineers, Industrial	7,528	15,600	390	624	1,014	15	999	157	Industrial Tech.
007	Engineers, Mechanical	9,838	16,500	412	660	1,072	40	1,032	157	Mechanical Tech.
011	Engineers, Metallurgical	3,358	5,500	137	242	379	23	356	160	Metallurgical Tech.
010	Engineers, Mining	648	500	12	17	29	--	29	122	Mining Technology
010	Engineers, Sales	4,756	7,100	177	284	461	16	445	149	Sales Technology
019	Other Engineers Technical	5,105	11,500	287	460	747	174	573	199	Technology Specialty
	Natural Scientists	9,122	18,200	455	728	1,183	--	--		
013	Agricultural Scientists	265	400	100	16	116	--	--	180	Agriculture Science
041	Biological Scientists	508	1,300	32	52	84	--	--		Biological Science
022	Chemists	6,630	12,700	229	508	737	--	--	152	Chemical Science
024	Geologists & Geophysicists	320	400	10	16	26	--	--		Geological Science
020	Mathematicians	332	900	22	36	58	--	--		Mathematical Science
023	Physicists	896	1,900	47	76	123	--	--		Physical Science
099	Other Natural Scientists	171	600	15	24	39	--	--	199	Science Specialty
	Technicians Excluding Medical and Dental	31,033	56,000	1,736	2,520	4,256	2,177	2,079		
017	Designers	3,984	7,500	225	300	525	68	457	059	Drafting & Design
726	Electrical & Electronic	5,732	10,900	272	545	817	1,734	-917	056	Elect. Technology
	Radio Operators	1,013	1,300	32	39	71	2	69	055	Elect. Communication
018	Surveyors	1,985	3,300	82	132	214	10	204	053	Civil Technology
	Technicians, other	18,319	33,000	1,125	1,504	2,629	363	2,266	099	Tech. Specialty

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DOT CODE	Occupational Classification	Census 1960 (1)	Projected Employment 1975 (2)	Annual With-Drawal (3)	Annual Growth (4)	Annual Demand (5)	Annual Supply (6)	Annual Need (7)	Penna. Code	Preparatory Curriculum
	Medical & Other Health Workers	90,660	157,400	4,879	6,296	11,175	1,200	5,107		
	Chiropractors & Therapists	3,257	4,900	137	205	342	--	--		Physical Therapy
072	Dentists	5,873	8,300	207	332	539	--	--		Dentistry
077	Dietitians & Nutritionists	1,597	2,100	84	94	178	--	--	115	Dietetics & Nutrit.
075	Nurses, Professional	40,611	67,600	1,919	2,528	4,447	205	4,242	176	Nursing, R.N.
	Nurses, Student	7,626	16,600	664	664	1,328	--	--	176	Nursing, R.N.
	Optometrists	933	1,700	42	68	110		--	075	Opticians
071	Osteopaths	447	1,900	47	76	123	--	--		Osteopathy
074	Pharmacists	5,869	6,600	16[illegible]	264	429	--	--		Pharmacology
070	Physicians & Surgeons	15,459	24,000	600	1,008	1,608	--	--		Internal Medicine
045	Psychologists	741	2,100	58	88	146	--	--		Psychology
079	Technicians, Medical and Dental	7,672	20,600	931	929	1,860	995	865		Medical Assistant
073	Veterinarians	575	1,000	25	40	65	--	--		Veterinary Medicine
	Teachers	105,708	149,900	5,696	6,145	11,841	--	--		
092	Teachers Elementary	53,341	62,700	2,836	2,719	5,555	--	--		Teacher Education
091	Teachers Secondary	33,104	52,500	1,785	2,000	3,785	--	--		Teacher Education
	Teachers Other excluding college	8,951	15,500	480	620	1,100	--	--		Teacher Education
090	Teachers College	10,312	19,200	595	806	1,401	--	--		Teacher Education
	Social Scientists	2,169	3,700	92	148	240	--	--		
050	Economists	937	1,300	32	52	84	--	--		Economics
020	Statisticians & Actuaries	1,121	2,200	55	88	143	--	--	190	Business Education
059	Other Social Scientists	111	200	5	8	13	--	--		Sociology Specialty
	Other Professional, Technical and Kindred Workers	148,707	229,100	5,956	9,164	15,120	1,954	8,107		
160	Accountants & Auditors	27,920	38,700	967	1,548	2,515	--	--	090	Accounting & Comput.
001	Architects	1,505	2,000	50	100	150	--	--	150	Architectual Eng.
017	Draftsmen	18,407	28,700	717	1,262	1,979	1,567	412	059	Drafting & Design
110	Lawyers & Judges	9,392	12,800	320	512	832	--	--		Law
166	Personnel & Labor Relation Workers	5,739	9,800	245	392	637	--	--		Personnel & Traing.

DOT. CODE	Occupational Classification	Census 1960 (1)	Projected Employment 1975 (2)	Annual With-Drawal (3)	Annual Growth (4)	Annual Demand (5)	Annual Supply (6)	Annual Need (7)	Penna. Code	Preparatory Curriculum
195	Social & Welfare Workers (N.E.C.)	5,868	11,000	442	483	925	--			Sociology Speciality
	Professional, Technical and Kindred Workers	79,876	126,100	8,215	4,867	8,082	387	7,695		Curriculum Spec.
421	FARMERS AND FARM WORKERS	98,764	74,000	2,590	-1,332	1,258	1,005	253	080	Agriculture Spec.
185	MANAGERS, OFFICIALS & PROPRIETORS	290,385	363,000	9,801	-1,597	8,204	2,685	5,519		Curriculum Spec.
200	CLERICAL & KINDRED WORKERS	591,172	812,500	28,437	19,500	47,937	44,293	3,644		Office Train. Spec.
217	Accounting Clerks and Bkprs.	45,745	56,700	1,814	1,417	3,231	9,181	-5,950	090	Accounting & Computing
212	Bank Tellers	8,377	14,200	482	340	822	8	814	092	General Clerical
211	Cashiers	26,664	50,300	1,911	1,207	3,118	375	2,743	092	General Clerical
219	Office Machine Operators	18,846	43,600	1,831	1,308	3,139	4,063	-924	091	General Bus. Data
232	Postal Clerks	13,278	13,300	345	319	664	--	664	092	General Clerical
237	Receptionists	6,809	9,800	392	294	686	429	257	092	General Clerical
201	Secretaries	91,883	138,500	5,817	4,432	10,249	13,960	-3,711	094	Steno-Secretarial
222	Shipping & Receiving Clerks	23,727	23,300	605	559	1,164	22	1,142	049	Distributive Occ.
202	Stenographers	18,060	27,200	1,142	870	2,012	1,496	516	094	Steno-Secretarial
223	Stock Clerks & Storekeepers	20,921	39,700	1,588	1,191	2,779	124	2,655	049	Distributive Occ.
235	Telephone Operators	21,335	22,900	1,030	480	1,510	1	1,509	092	General Clerical
203	Typists	31,579	47,000	2,115	1,081	3,196	473	2,723	092	General Clerical
209	Other Clerical & Kindred	263,948	326,000	9,365	6,002	15,367	14,161	1,206	092	General Clerical
250	SALES WORKERS	306,840	388,700	12,058	4,664	16,722	3,326	13,396		Distributive Occ.
258	Advertising Agents & Sales	1,581	2,300	64	34	98		98	049	Distributive Occ.
287	Demonstrators	1,272	1,800	57	21	78	221	-143	049	Distributive Occ.
250	Insurance Agents, Brokers	23,117	28,000	728	33	761	--	761	049	Distributive Occ.
250	Real Estate Agents & Brokers	7,522	10,400	280	135	415	--	415	049	Distributive Occ.
251	Stock & Bond Salesmen	1,756	2,500	280	248	528	--	528	049	Distributive Occ.
299	Other Sales Workers (N.E.C.)	271,592	343,700	10,649	4,193	14,842	3,105	11,737	049	Distributive Occ.

DOT CODE	Occupational Classification	Census 1960 (1)	Projected Employment 1975 (2)	Annual With-Drawal (3)	Annual Growth (4)	Annual Demand (5)	Annual Supply (6)	Annual Need (7)	Penna. Code	Preparatory Curriculum
	CRAFTSMEN, FOREMEN & KINDRED	618,288	759,000	21,213	15,204	36,417	10,280	26,137		Trade & Indust. Occ.
	Construction Craftsmen	143,853	168,300	5,486	3,534	9,020	2,348	6,672		Curriculum Spec.
861	Brickmasons, Stone, Tile	14,279	16,500	506	247	753	67	686	019	Masonry
860	Carpenters	39,642	42,000	1,616	642	2,258	676	1,582	007	Carpentry
821	Electricians	23,358	28,500	812	669	1,481	1,050	431	014	Electrical Trades
850	Excavating, Grading Oprs.	10,941	11,800	318	518	836	101	735	041	Heavy Eq. Operator
840	Painters & Paperhangers	20,893	22,500	1,001	450	1,451	181	1,270	024	Painting & Decorating
842	Plasterers	3,813	4,900	122	24	146		146	019	Masonry
862	Plumbers & Pipefitters	22,887	29,600	799	888	1,687	168	1,519	026	Plumbing
866	Roofers & Slaters	3,548	5,700	142	28	170	--	170	006	Building & Maint.
899	Structural Metal Workers	4,492	6,800	170	68	238	105	133	031	Sheet Metal
	Foremen (N.E.C.)	88,132	118,500	2,962	1,185	4,147	--	4,147		Foremanship Training
	Metalwrkg. Craftsmen Excluding Mechanics	74,644	77,500	1,937	3,100	5,037	1,884	3,153		Trade & Indust. Occup.
610	Blacksmiths, Forgemen	3,336	2,600	65	26	91	--	91	020	Metal Trades
805	Boilermakers	2,382	2,300	52	5	57	7	50	020	Metal Trades
512	Heat Treaters, Annealers	2,163	1,800	45	36	81	--	81	020	Metal Trades
600	Machinists	41,857	42,000	1,049	2,268	3,317	1,680	1,637	018	Machine Shop
638	Millwrights	6,074	7,500	187	150	337	17	320	018	Machine Shop
804	Sheet Metal Workers	7,808	9,800	245	98	343	180	163	031	Sheet Metal
601	Toolmakers, Diemakers	11,024	11,500	287	517	804	---	804	018	Machine Shop
	Mechanics & Repairmen	151,743	230,400	5,760	5,299	11,059	4,160	6,899		Trade & Indust. Occup.
827	Air Condt., Heating & Ref.	3,724	5,400	135	108	243	320	-77	001	Air Condt. & Heating
621	Airplane	2,558	2,300	57	23	80	345	-265	002	Aircraft Mechanics
620	Motor Vehicles	43,438	56,000	1,400	1,680	3,080	2,202	878	005	Auto Mechanics
633	Office Machine Repairmen	1,631	3,700	92	232	324	71	253	003	Appliance Repair
822	Radio & TV Repairmen	5,825	9,000	225	180	405	288	117	029	Radio & TV
	Other Mechanics & Repairmen	94,567	154,000	3,851	3,084	6,935	934	6,001	003	Appliance Repair
	Printing Trades Craftsmen	21,005	22,000	550	110	660	594	66		Trade & Indust. Occup.
650	Compositors & Typesetters	13,314	10,900	272	11	283	516	-233	028	Printing
974	Electro & Stereotypers	652	1,000	25	1	26	30	-4	028	Printing
971	Engravers & Lithographers	2,189	3,600	91	47	138	48	90	028	Printing

DOT CODE	Occupational Classification	Census 1960 (1)	Projected Employment 1975 (2)	Annual With-Drawal (3)	Annual Growth (4)	Annual Demand (5)	Annual Supply (6)	Annual Need (7)	Penna. Code	Preparatory Curriculum
651	Pressmen & Plate Printers	4,850	6,500	162	51	213	--	213	028	Printing
	Other Craftsmen and Kind.	138,911	142,300	4,518	1,976	6,494	1,294	5,200		Trade & Indust.Occup.
526	Bakers	9,306	12,500	502	137	639	46	593	015	Food Trades
660	Cabinetmakers	3,626	3,900	97	58	155	247	-92	021	Mill Cabinetry
921	Cranesmen, Derrickmen, and Hoistmen	19,721	26,000	650	442	1,092	--	1,092	040	General Industrial
002	Inspectors	11,239	16,400	410	164	574	--	574	058	Instrumentation
700	Jwlrs., Wtchmkrs., Gold and Silversmiths	1,782	2,200	55	22	77	31	46	058	Instrumentation
321	Linemen & Servicemen	16,391	21,300	534	319	853	3	850	014	Electrical Trades
628	Loom Fixers	1,205	1,100	27	5	32	--	32	018	Machine Shop
079	Opticians, Lens Grinders and Polishers	1,364	2,100	52	12	64	--	64	075	Optician
769	Patrn. & Model Mkrs., Excluding Paper	3,602	5,000	125	50	175	50	125	025	Patternmaking
950	Stationary Engineers	19,444	20,500	512	102	614		614	040	General Industrial
739	Upholsterers	2,916	4,400	110	66	176	34	142	036	Upholstery
	Craftsmen (N.E.C.)	48,315	26,900	1,444	597	2,043	883	1,160	199	Trade Speciality
	OPERATIVES & KINDRED WORKERS	935,328	1,073,000	51,655	-9,442	42,213	4,845	37,368		Trade and Indust.Occ.
	Apprentices	5,741	7,000	140	280	420	--	420	199	Trade Speciality
739	Assemblers	33,968	40,500	1,215	810	2,025	--	2,025	040	General Industrial
720	Checkers, Examiners Inspectors	37,695	52,500	1,575	1,837	3,412	--	3,412	040	General Industrial
906	Deliverymen, Routemen and Cab Drivers	36,120	50,800	1,422	1,016	2,438	--	2,438	039	Occup. Orientation
502	Furnacemen, Smeltermen and Pourers	9,237	8,300	207	-83	124	--	124	040	General Industrial
504	Heaters, Metal	2,083	2,600	65	-26	39		39	040	General Industrial
361	Laundry & Dry Cleaning	20,732	24,200	968	605	1,573	6	1,567	017	Laundry-Press
939	Mine Operatives & Laborers (N.E.C.)	35,068	20,000	700	-450	300	53	247	022	Mine Maintenance

DOT CODE	Occupational Classification	Census 1960 (1)	Projected Employment 1975 (2)	Annual With-Drawal (3)	Annual Growth (4)	Annual Demand (5)	Annual Supply (6)	Annual Need (7)	Penna. Code	Preparatory Curriculum
316	Meat Cutters, Excluding Slightr. & Pckg. House	11,688	15,900	397	477	874	17	857	015	Food Trades
952	Power Station Operators	2,100	2,800	70	-28	42	76	-34	014	Electrical Trades
904	Truck & Tractor Drivers	101,221	128,000	3,200	5,120	8,320	175	8,145	039	Occup. Orientation
312	Welders & Flame Cutters	34,761	46,000	1,150	1,380	2,530	811	1,719	037	Welding
	Semiskilled Textile	93,679	95,900	4,795	-1,918	2,877	3,388	-511	035	Textile Production
685	Knitters, Loopers & Toppers	5,011	3,342	133	-33	100	130	-30	035	Textile Production
689	Sewers & Stitchers	82,342	88,585	4,504	-1,847	2,657	3,103	-446	027	Power Sewing
682	Spinners, Textile	1,175	1,693	67	-16	51	66	-15	035	Textile Production
683	Weavers, Textile	5,149	2,280	91	-22	69	89	-20	035	Textile Production
	Other Operatives (N. E.C.)	511,235	578,500	35,751	-18,512	17,239	319	16,920		Occup. Orientation
	SERVICE WORKERS, PRIVATE HOUSEHOLD	76,349	93,500	3,646	187	3,833	--	3,833	099	Inst. & Health Wrks.
	SERVICE WORKERS, EXCLUDING PRIVATE HOUSEHOLD	338,952	515,000	36,100	17,102	53,202	3,561	49,641	099	Inst. & Health Wrks.
	Protective Service Workers	43,329	71,000	2,250	2,534	4,784	8	4,776		Public Service
373	Firemen, Fire Protection	6,427	10,700	367	260	627		627		Public Service
375	Policemen, Marshals	17,514	35,800	1,171	1,584	2,755	8	2,747		Public Service
379	Guards, Watchmen	19,388	24,500	712	690	1,402		1,402		Public Service
311	Waiters, Cooks & Bar.	126,813	190,700	21,009	6,654	27,663	476	27,187	015	Food Trades
312	Bartenders	18,086	26,200	786	707	1,493	174	1,319		General Education
314	Cooks	28,029	39,700	2,191	1,794	3,985	202	3,783	015	Food Trades
317	Counter & Fountain Workers	10,478	20,000	1,000	800	1,800	12	1,788	097	Foods Service
311	Kitchen Workers	19,492	28,500	5,928	427	6,355		6,355	015	Food Trades
	Waiters, Waitresses	50,728	76,300	11,104	2,925	14,030	88	13,942	097	Foods Service
	Other Service Workers	168,810	190,800	10,766	5,589	16,355	2,553	13,802	099	Inst. & Health Aides
329	Attendants, Hospt. and Inst.	21,243	46,600	2,796	2,097	4,893	1,022	3,871	074	Nurses Aides
330	Barbers	11,126	16,800	420	168	588	31	557	009	Cosmetology
381	Chorwomen & Cleaners	16,573	24,400	1,220	244	1,464	--	1,464	099	Inst. & Health Aides
332	Hairdressers & Cosmetologists	18,673	30,000	1,800	900	2,700	292	2,408	009	Cosmetology
382	Janitors & Sextons	39,001	44,000	3,080	440	3,520	7	3,513	006	Building Maintenance
	Practical Nurses	13,125	29,000	1,450	1,740	3,190	1,201	1,989	076	Practical Nursing
	Other Service Workers (N.E.C.)	46,069	62,500	2,075	2,325	4,400	524	3,876	039	Occup. Orientation
	LABORERS, EXCLUDING FARM AND MINE	239,974	232,800	5,870	-6,574	-704	--	-704		
	OCCUPATION NOT REPORTED	190,087								

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CUMBERLAND COUNTY

DOT CODE	Occupational Classification	Projected Employment 1975 (1)	Annual With-Drawal (2)	Annual Growth (3)	Annual Demand (4)	Annual Supply (5)	Annual Need (6)	Penna. Code	Preparatory Curriculum
	GRAND TOTAL	72,219	2,138	727	3,767	612	2,673		
	PROFESSIONAL, TECHNICAL & KINDRED WORKERS	11,760	341	470	811	0	329		
	Engineers, Technical	1,825	45	73	118	0	118		
002	Engineers, Aeronautical	3	0	0	0	0	0	102	Aeron. Technology
008	Engineers, Chemical	18	0	0	0	0	0	152	Chemical Technology
005	Engineers, Civil	595	14	23	37	0	37	153	Civil Technology
003	Engineers, Electrical	368	9	16	25	0	25	154	Elect. Technology
012	Engineers, Industrial	342	8	13	21	0	21	157	Industrial Tech.
007	Engineers, Mechanical	165	4	6	10	0	10	157	Mechanical Tech.
011	Engineers, Metallurgical	48	1	2	3	0	3	160	Metallurgical Tech.
010	Engineers, Mining	5	0	0	0	0	0	122	Mining Technology
010	Engineers, Sales	50	1	2	3	0	3	149	Sales Technology
019	Other Engineers, Technical	231	5	9	14	0	14	199	Technology Spec.
	Natural Scientists	240	6	9	15	0	0		
013	Agricultural Scientists	5	0	0	0	0	0	180	Agriculture Science
041	Biological Scientists	5	0	0	0	0	0		Biological Science
022	Chemists	170	3	6	9	0	0	152	Chemical Science
024	Geologists & Geophysicists	25	0	1	1	0	0		Geological Science
020	Mathematicians	2	0	0	0	0	0		Mathematical Science
023	Physicists	5	0	0	0	0	0		Physical Science
099	Other Natural Scientists	28	0	1	1	0	0	199	Science Speciality
	Technicians Excluding Medical and Dental	1,025	31	46	77	0	77		
017	Designers	100	3	4	7	0	7	059	Drafting & Design
726	Electrical & Electronic	190	4	9	13	0	13	056	Elect. Technology
	Radio Operators	40	1	1	2	0	2	055	Elect. Communication
018	Surveyors	105	2	4	6	0	6	053	Civil Technology
	Technicians, Other	590	20	27	47	0	47	099	Technical Specialty
	Medical & Other Health Workers	1,778	55	71	126	0	66		
	Chiropractors & Therapists	55	1	2	3	0	0		Physical Therapy
072	Dentists	90	2	3	5	0	0		Dentistry
077	Dietitians & Nutritionists	32	1	1	2	0	0	115	Dietetics & Nutrition

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075	Nurses, Professional	880	24	32	56	0	56	176	Nursing, R.N.
	Nurses, Student	75	3	3	6	0	0	176	Nursing, R.N.
	Optometrists	26	0	1	1	0	0	075	Opticians
071	Osteopaths	20	0	0	0	0	0		Osteopathy
074	Pharmacists	60	1	2	3	0	0		Pharmacology
070	Physicians & Surgeons	350	8	14	22	0	0		Internal Medicine
045	Psychologists	25	0	1	1	0	0		Psychology
079	Technicians, Medical & Dental	130	5	5	10	0	10	072	Medical Assistant
073	Veterinarians	35	0	1	1	0	0		Veterinary Medicine
	Teachers	2,965	103	148	251	0	0		
092	Teachers, Elementary	1,200	45	49	94	0	0		Teacher Education
091	Teachers, Secondary	1,110	37	42	79	0	0		Teacher Education
	Teachers, Other Excl. College	210	6	8	14	0	0		Teacher Education
090	Teachers, College	445	13	17	30	0	0		Teacher Education
	Social Scientists	120	3	4	7	0	0		
050	Economists	18	0	0	0	0	0		Economics
020	Statisticians & Actuaries	95	2	3	5	0	0	190	Business Education
059	Other Social Scientists	7	0	0	0	0	0		Sociology Speciality
	Other Professional, Technical and Kindred Workers	3,807	98	152	250	0	145		
160	Accountants & Auditors	835	20	33	53	0	0	090	Accounting & Computing
001	Architects	45	1	1	2	0	0	150	Architectual Eng.
017	Draftsmen	365	9	16	25	0	25	059	Drafting & Design
110	Lawyers & Judges	255	6	10	16	0	0		Law
166	Personnel & Labor Relation Workers	300	7	12	19	0	0		Personnel & Training
195	Social & Welfare Workers	150	5	6	11	0	0		Sociology Speciality
	Prof., Tech. Workers, (N.E.C.L.)	1,857	48	72	120	0	120		Curriculum Spec.
421	FARMERS AND FARM WORKERS	1,900	66	-34	32	40	-8	080	Agriculture Spec.
185	MANAGERS, OFFICIALS & PROPRIETORS	5,850	157	-23	134	2	132		Curriculum Spec.
200	CLERICAL AND KINDRED WORKERS	15,300	535	367	902	504	398		Office Train. Spec.
217	Accounting Clerks & Bookkeepers	725	22	18	40	82	-42	090	Accounting & Computing
212	Bank Tellers	200	6	4	10	0	10	092	General Clerical
211	Cashiers	760	28	18	46	0	46	092	General Clerical

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219	Office Machine Operators	1,125	47	33	80	32	48	091	Business Data Proc.
232	Postal Clerks	175	4	4	8	0	8	092	General Clerical
237	Receptionists	90	3	2	5	0	5	092	General Clerical
201	Secretaries	2,140	89	68	157	192	-35	094	Steno-Secretarial
222	Shipping & Receiving Clerks	230	5	5	10	0	10	049	Distributive Occ.
202	Stenographers	660	27	21	48	2	46	094	Steno-Secretarial
223	Stock Clerks & Storekeepers	770	30	23	53	0	53	049	Distributive Occ.
235	Telephone Operators	370	16	7	23	0	23	092	General Clerical
203	Typists	1,540	69	35	104	0	104	092	General Clerical
209	Other Clerical & Kindred Workers	6,515	188	117	305	196	109	092	General Clerical
250	SALES WORKERS	6,770	209	81	290	0	290		Distributive Occ.
258	Advertising Agents & Salesmen	25	0	0	0	0	0	049	Distributive Occ.
287	Demonstrators	35	1	0	1	0	1	049	Distributive Occ.
250	Insurance Agents, Brokers & U-Writ.	545	14	6	20	0	20	049	Distributive Occ.
250	Real Estate Agents & Brokers	200	5	2	7	0	7	049	Distributive Occ.
251	Stock & Bond Salesmen	35	0	0	0	0	0	049	Distributive Occ.
299	Other Sales Workers (N.E.C.)	5,930	183	71	254	0	254	049	Distributive Occ.
	CRAFTSMEN,FOREMEN & KINDRED WORKERS	9,299	260	185	445	60	385		Trade & Indust. Occ.
	Construction Craftsmen (Incl.Maint)	2,230	73	46	119	10	109		Curriculum Spec.
861	Brickmasons, Stone,Tile Setters	215	10	3	13	5	8	019	Masonry
860	Carpenters	585	18	8	26	5	21	007	Carpentry
821	Electricians	345	10	8	18	0	18	014	Electrical Trades
850	Excavating,Grading Machine Operator	175	4	7	11	0	11	041	Heavy Eq. Operator
840	Painters & Paperhangers	375	16	7	23	0	23	024	Painting & Decorating
842	Plasterers	55	1	0	1	0	1	019	Masonry
862	Plumbers & Pipefitters	360	9	10	19	0	19	026	Plumbing
866	Roofers & Slaters	80	2	0	2	0	2	006	Building & Maint.
899	Structural Metal Workers	40	1	0	1	0	1	031	Sheet Metal
	Foremen (N.E.C.)	1,385	34	13	47	0	47		Foremanship Training
	Metalwrkg. Craftsmen Excl. Mechanics	569	14	22	36	15	21		Trade & Indust. Occup.

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610	Blacksmiths,Forgemen,Hammen	20	0	1	1	15	-14	020	Metal Trades
805	Boilermakers	20	0	0	0	0	0	020	Metal Trades
504	Heat Treaters,Annealers,Tempers	15	0	0	0	0	0	020	Metal Trades
600	Machinists	355	8	7	15	0	15	018	Machine Shop
638	Millwrights	35	0	0	0	0	0	018	Machine Shop
804	Tin-+Coprsmiths,Sheet Mtl. Wrks.	115	2	1	3	0	3	031	Sheet Metal
601	Toolmakers,Diemakers & Setters	9	0	0	0	0	0	018	Machine Shop
	Mechanics & Repairmen	3,405	85	78	163	29	134		Trade & Indust.Occup.
827	Air Condt.,Heating & Refrig. Mnt.	55	1	1	2	0	2	001	Air Condt.+Heating
621	Airplane Mechanic	70	1	0	1	0	1	002	Aircraft Mechanics
620	Motor Vehicle Mechanic	755	18	22	40	1	39	005	Auto Mechanics
633	Office Machine Repairmen	80	2	4	6	0	6	003	Appliance Repair
822	Radio & TV Repairmen	155	3	3	6	17	-11	029	Radio & TV
	Other Mechanics & Repairmen	2,290	54	32	86	11	75	003	Appliance Repair
	Printing Trades Craftsmen	275	6	1	7	0	7		Trade & Indust.Occup.
650	Compositors & Typesetters	140	3	0	3	0	3	028	Printing
974	Electrotypers & Steretypers	10	0	0	0	0	0	028	Printing
971	Engravers & Lithographers	45	1	0	1	0	1	028	Printing
651	Pressmen & Plate Printers	80	2	0	2	0	2	028	Printing
	Other Craftsmen & Kindred Workers	1,435	34	20	54	6	48		Trade & Indust.Occup.
526	Bakers	120	3	1	4	0	4	015	Food Trades
660	Cabinetmakers	30	0	0	0	6	-6	021	Mill Cabinetry
921	Cranesmen,Derrickmen & Hoistmen	240	6	4	10	0	10	040	General Industrial
002	Inspectors	300	7	3	10	0	10	058	Instrumentation
700	Jwlrs.,Wtchmkrs.,Gold+Slvrsmiths	15	0	0	0	0	0	058	Instrumentation
821	Line+Srvcmen,Tgrph.,Tphone+Pwr.	325	8	4	12	0	12	014	Electrical Trades
628	Loom Fixers	25	0	0	0	0	0	018	Machine Shop
079	Opticians,Lens Grinders+Polishers	20	0	0	0	0	0	075	Optician
769	Patrn.+Model Mkrs.,Exc. Paper	50	1	0	1	0	1	025	Patternmaking
950	Stationary Engineers	205	5	1	6	0	6	040	General Industrial
739	Upholsterers	50	1	0	1	0	1	036	Upholstery
	Craftsmen (N.E.C.)	55	2	1	3	0	3	199	Trade Speciality
	OPERATIVES & KINDRED WORKERS	11,480	551	-103	448	0	448		Trade & Indust.Occup.

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	Apprentices	80	2	3	5	0	5	199	Trade Speciality
739	Assemblers	170	5	-12	-7	-0	-7	040	General Industrial
720	Checkers,Examiners & Inspectors	385	12	3	15	0	15	040	General Industrial
906	Deliverymen,Routemen & Cab Drivers	520	14	5	19	0	19	039	Occup. Orientation
502	Furnacemen,Smeltermen & Pourers	130	3	-1	2	0	2	040	General Industrial
504	Heaters, Metal	40	1	0	1	0	1	040	General Industrial
361	Laundry & Dry Cleaning Workers	320	16	4	20	0	20	017	Laundry-Press
939	Mine Operatives & Laborers (N.E.C.)	95	2	0	2	0	2	022	Mine Maintenance
316	Meat Cutters,Excl.Slghtr.+Pckg.Hse.	150	3	0	3	0	3	015	Food Trades
952	Power Station Operators	30	0	0	0	0	0	014	Electrical Trades
904	Truck & Tractor Drivers	1,775	44	35	79	0	79	039	Occup. Orientation
812	Welders & Flame -Cutters	415	10	8	18	0	18	037	Welding
	Semiskilled Textile Occupations	1,362	68	-2	66	0	66	035	Textile Production
685	Knitters,Loopers & Toppers	25	1	0	1	0	1	035	Textile Production
689	Sewers & Stitchers	1,220	48	-1	47	0	47	027	Power Sewing
682	Spinners, Textile	2	0	0	0	0	0	035	Textile Production
683	Weavers, Textile	115	11	0	11	0	11	035	Textile Production
	Other Operatives (N.E.C.)	6,008	372	-18	354	0	354		Occup. Orientation
	SERVICE WORKERS, PRIVATE HOUSEHOLD	985	38	0	38	3	35	099	Inst. & Health Workers
	SERVICE WORKERS, EXCLUDING PRIVATE HOUSEHOLD	6,550	458	216	674	3	671	099	Inst. & Health Workers
	Protective Service Workers	845	34	27	61	0	61		Public Service
373	Firemen, Fire Protection	95	3	2	5	0	5		Public Service
375	Policemen, Marshals,Sheriffs	430	14	18	32	0	32		Public Service
379	Guards, Watchmen	320	9	8	17	0	17		Public Service
311	Waiters, Cooks & Bartenders	2,570	280	89	369	0	369	015	Food Trades
312	Bartenders	255	7	6	13	0	13		General Education
314	Cooks	595	32	26	58	0	58	015	Foods Trade
317	Counter & Fountain Workers	245	12	9	21	0	21	097	Foods Service
311	Kitchen Workers (N.E.C.)	385	17	14	31	0	31	015	Foods Trade
	Waiters, Waitresses	1,090	22	16	38	0	38	097	Foods Service

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478	Other Service Workers	3,135	131	68	199	3	196	099	Inst.+Health Aides
329	Attendants,Hospt. & Other Inst.	400	24	18	42	0	42	074	Nurses Aide
330	Barbers	190	4	1	5	0	5	009	Cosmetology
381	Chorwomen & Cleaners	250	12	2	14	0	14	099	Inst.+Health Aides
332	Hairdressers & Cosmetologists	440	26	13	39	3	36	009	Cosmetology
382	Janitors & Sextons	670	46	6	52	0	52	006	Building Maintenance
	Practical Nurses	300	15	18	33	0	33	076	Practical Nursing
	Other Service Workers (N.E.C.)	885	29	32	61	0	61	039	Occup. Orientation
	LABORERS, EXCLUDING FARM AND MINE	2,325	58	-65	-7	-0	-7	039	Occup. Orientation

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	GRAND TOTAL	10,100	420	108	536	150	349		
	PROFESSIONAL, TECHNICAL & KINDRED WORKERS	875	25	35	60	0	60		
	Engineers, Technical	87	2	3	5	0	5		
002	Engineers, Aeronautical	0	0	0	0	0	0	102	Aeron. Technology
008	Engineers, Chemical	2	0	0	0	0	0	152	Chemical Technology
005	Engineers, Civil	35	0	1	1	0	1	153	Civil Technology
003	Engineers, Electrical	12	0	0	0	0	0	154	Elect. Technology
012	Engineers, Industrial	3	0	0	0	0	0	157	Industrial Tech.
007	Engineers, Mechanical	10	0	0	0	0	0	157	Mechanical Tech.
011	Engineers, Metallurgical	5	0	0	0	0	0	160	Metallurgical Tech.
010	Engineers, Mining	0	0	0	0	0	0	122	Mining Technology
010	Engineers, Sales	5	0	0	0	0	0	149	Sales Technology
019	Other Engineers, Technical	15	0	0	0	0	0	199	Technology Spec.
	Natural Scientists	17	0	0	0	0	0		
013	Agricultural Scientists	1	0	0	0	0	0	180	Agriculture Science
041	Biological Scientists	0	0	0	0	0	0		Biological Science
022	Chemists	10	0	0	0	0	0	152	Chemical Science
024	Geologists & Geophysicists	2	0	0	0	0	0		Geological Science
020	Mathematicians	0	0	0	0	0	0		Mathematical Science
023	Physicists	0	0	0	0	0	0		Physical Science
099	Other Natural Scientists	4	0	0	0	0	0	199	Science Speciality
	Technicians Excluding Medical and Dental	78	2	3	5	0	5		
017	Designers	8	0	0	0	0	0	059	Drafting & Design
726	Electrical & Electronic	15	0	0	0	0	0	056	Elect. Technology
	Radio Operators	5	0	0	0	0	0	055	Elect. Communication
018	Surveyors	10	0	0	0	0	0	053	Civil Technology
	Technicians, Other	40	1	1	2	0	2	099	Technical Specialty
	Medical & Other Health Workers	161	4	6	10	0	10		
	Chiropractors & Therapists	5	0	0	0	0	0		Physical Therapy
072	Dentists	8	0	0	0	0	0		Dentistry
077	Dietitians & Nutritionists	5	0	0	0	0	0	115	Dietetics & Nutrition

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075	Nurses, Professional	85	2	3	5	0	5	176	Nursing, R.N.
	Nurses, Student	0	0	0	0	0	0	176	Nursing, R.N.
	Optometrists	3	0	0	0	0	0	075	Opticians
071	Osteopaths	7	0	0	0	0	0		Osteopathy
074	Pharmacists	10	0	0	0	0	0		Pharmacology
070	Physicians & Surgeons	13	0	0	0	0	0		Internal Medicine
045	Psychologists	0	0	0	0	0	0		Psychology
079	Technicians, Medical & Dental	20	0	0	0	0	0	072	Medical Assistant
073	Veterinarians	5	0	0	0	0	0		Veterinary Medicine
	Teachers	355	12	17	29	0	0		
092	Teachers, Elementary	175	6	7	13	0	0		Teacher Education
091	Teachers, Secondary	170	5	6	11	0	0		Teacher Education
	Teachers, Other Excl. College	10	0	0	0	0	0		Teacher Education
090	Teachers, College	0	0	0	0	0	0		Teacher Education
	Social Scientists	7	0	0	0	0	0		
050	Economists	2	0	0	0	0	0		Economics
020	Statisticians & Actuaries	5	0	0	0	0	0	190	Business Education
059	Other Social Scientists	0	0	0	0	0	0		Sociology Speciality
	Other Professional, Technical & Kindred Workers	170	4	6	10	0	3		
160	Accountants & Auditors	40	1	1	2	0	0	090	Accounting & Computing
001	Architects	5	0		0	0	0	150	Architectual Eng.
017	Draftsmen	20	0	0	0	0	0	059	Drafting & Design
110	Lawyers & Judges	15	0	0	0	0	0		Law
166	Personnel & Labor Relation Wrks.	20	0	0	0	0	0		Personnel & Training
195	Social & Welfare Workers	15	0	0	0	0	0		Sociology Speciality
	Prof., Tech. Workers,(n.e.c.l.)	55	1	2	3	0	3		Curriculum Spec.
421	FARMERS AND FARM WORKERS	1,000	35	-18	17	13	4	080	Agriculture Spec.
185	MANAGERS, OFFICIALS & PROPRIETORS	700	18	-2	16	0	16		Curriculum Spec.
200	CLERICAL AND KINDRED WORKERS	1,800	63	43	106	137	-31		Office Train. Spec.
217	Accounting Clerk & Bookkeepers	100	3	2	5	0	5	090	Accounting & Computing
212	Bank Tellers	25	0	0	0	0	0	092	General Clerical
211	Cashiers	110	4	2	6	8	-2	092	General Clerical

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219	Office Machine Operators	165	6	4	10	0	10	091	Business Data Proc.
232	Postal Clerks	20	0	0	0	55	-55	092	General Clerical
237	Receptionists	10	0	0	0	0	0	092	General Clerical
201	Secretaries	310	13	9	22	0	22	094	Steno-Secretarial
222	Shipping & Receiving Clerks	30	0	0	0	0	0	049	Distributive Occ.
202	Stenographers	95	3	3	6	0	6	094	Steno-Secretarial
223	Stock Clerks & Storekeepers	105	4	3	7	0	7	049	Distributive Occ.
235	Telephone Operators	55	2	1	3	0	3	092	General Clerical
203	Typists	225	10	5	15	0	15	092	General Clerical
209	Other Clerical & Kindred Workers	550	15	9	24	66	-42	092	General Clerical
250	SALES WORKERS	680	21	8	29	0	29		Distributive Occ.
258	Advertising Agents & Salesmen	2	0	0	0	0	0	049	Distributive Occ.
287	Demonstrators	5	0	0	0	0	0	049	Distributive Occ.
250	Insurance Agents, Brokers & U-Writ.	40	1	0	1	0	1	049	Distributive Occ.
250	Real Estate Agents & Brokers	15	0	0	0	0	0	049	Distributive Occ.
251	Stock & Bond Salesmen	5	0	0	0	0	0	049	Distributive Occ.
299	Other Sales Workers (n.e.c.)	613	19	7	26	0	26	049	Distributive Occ.
	CRAFTSMEN, FOREMEN & KINDRED WORKERS	2,125	59	42	101	0	101		Trade & Indust. Occ.
	Construction Craftsmen (Incl. Maint.)	560	18	11	29	0	29		Curriculum Spec.
861	Brickmasons, Stone, Tile Setters	45	2	0	2	0	2	019	Masonry
860	Carpenters	215	6	3	9	0	9	007	Carpentry
821	Electricians	75	2	1	3	0	3	014	Electrical Trades
850	Excavating, Grading Machine Opr.	35	0	1	1	0	1	041	Heavy Eq. Operator
840	Painters & Paperhangers	80	3	1	4	0	4	024	Painting & Decorating
842	Plasterers	10	0	0	0	0	0	019	Masonry
862	Plumbers+ Pipefitters	80	2	2	4	0	4	026	Plumbing
866	Roofers & Slaters	15	0	0	0	0	0	006	Building & Maint.
899	Structural Metal Workers	5	0	0	0	0	0	031	Sheet Metal
	Foremen (N.E.C.)	300	7	3	10	0	10		Foremanship Training

Department of Public Instruction
Research Coordinating Unit
for Vocational Education

PENNSYLVANIA MANPOWER AND TRAINING DATA

PERRY COUNTY

DOT CODE	Occupational Classification	Projected Employment 1975 (1)	Annual With-Drawal (2)	Annual Growth (3)	Annual Demand (4)	Annual Supply (5)	Annual Need (6)	Penna. Code	Preparatory Curriculum
	Metalwrkg. Craftsmen Excluding Mechanics	142	3	5	8	0	8		Trade & Indust. Occup.
610	Blacksmiths, Forgemen, Hammen	5	0	0	0	0	0	020	Metal Trades
805	Boilermakers	5	0	0	0	0	0	020	Metal Trades
504	Heat Treaters, Annealers, Tempers	2	0	0	0	0	0	020	Metal Trades
600	Machinist	75	1	1	2	0	2	018	Machine Shop
638	Millwrights	10	0	0	0	0	0	018	Machine Shop
804	Tin+Coprsmiths, Sheet Mtl. Wrks.	25	0	0	0	0	0	031	Sheet Metal
601	Toolmakers, Diemakers & Setters	20	0	0	0	0	0	018	Machine Shop
	Mechanics & Repairmen	725	18	16	34	0	34		Trade & Indust. Occup.
827	Air Condt., Heating & Refrig. Mnt.	10	0	0	0	0	0	001	Air Condt. & Heating
621	Airplane Mechanic	10	0	0	0	0	0	002	Aircraft Mechanics
620	Motor Vehicle Mechanic	160	4	4	8	0	8	005	Auto Mechanics
633	Office Machine Repairmen	15	0	0	0	0	0	003	Appliance Repair
822	Radio & TV Repairmen	30	0	0	0	0	0	029	Radio & TV
	Other Mechanics & Repairmen	500	12	7	19	0	19	003	Appliance Repair
	Printing Trades Craftsmen	55	1	0	1	0	1		Trade & Indust. Occup.
650	Compositors & Typesetters	25	0	0	0	0	0	028	Printing
974	Electrotypers & Steretypers	5	0	0	0	0	0	028	Printing
971	Engravers & Lithographers	10	0	0	0	0	0	028	Printing
651	Pressmen & Plate Printers	15	0	0	0	0	0	028	Printing
	Other Craftsmen & Kindred Workers	343	8	4	12	0	12		Trade & Indust. Occup.
526	Bakers	25	0	0	0	0	0	015	Food Trades
660	Cabinetmakers	10	0	0	0	0	0	021	Mill Cabinetry
921	Cranesmen, Derrickmen & Hoistmen	50	1	0	1	0	1	040	General Industrial
002	Inspectors	60	1	0	1	0	1	058	Instrumentation
700	Jwlrs., Wtchmkrs., Gold & Slvrsmiths	5	0	0	0	0	0	058	Instrumentation
821	Line+Srvcmen, Tgrph., Tphone+Pwr.	70	1	1	2	0	2	014	Electrical Trades
628	Loom Fixers	0	0	0	0	0	0	018	Machine Shop
079	Opticians, Lens Grinders+Polishers	5	0	0	0	0	0	075	Optician
769	Patrn.+Model Mkrs., Exc.Paper	10	0	0	0	0	0	025	Patternmaking
950	Stationary Engineers	45	1	0	1	0	1	040	General Industrial
739	Upholsterers	15	0	0	0	0	0	036	Upholstery
	Craftsmen (N.E.C.)								

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	OPERATIVES & KINDRED WORKERS	2235	67	-20	47	0	47		Trade & Indust.Occup.
	Apprentices	10	0	0	0	0	0	199	Trade Speciality
739	Assemblers	35	1	-2	-1	-0	-1	040	General Industrial
720	Checkers,Examiners & Inspectors	75	2	0	2	0	2	040	General Industrial
906	Deliverymen,Routemen & Cab Drivers	110	3	1	4	0	4	039	Occup. Orientation
502	Furnacemen,Smeltermen & Pourers	25	0	0	0	0	0	040	General Industrial
504	Heaters, Metal	5	0	0	0	0	0	040	General Industrial
361	Laundry & Dry Cleaning Workers	65	3	0	3	0	3	017	Laundry-Press
939	Mine Operatives & Laborers (N.E.C.)	5	0	0	0	0	0	022	Mine Maintenance
316	Meat Cutters, Excl. Slghtr. & Pckg.Hse.	30	0	0	0	0	0	015	Food Trades
952	Power Station Operators	5	0	0	0	0	0	014	Electrical Trades
904	Truck & Tractor Drivers	365	9	7	16	0	16	039	Occup. Orientation
812	Welders & Lame-Cutters	80	2	1	3	0	3	037	Welding
	Semiskilled Textile Occupations	255	12	0	12	0	12	035	Textile Production
685	Knitters,Loopers & Toppers	5	0	0	0	0	0	035	Textile Production
689	Sewers & Stitchers	250	10	0	10	0	10	027	Power Sewing
682	Spinners, Textile	0	0	0	0	0	0	035	Textile Production
683	Weavers, Textile	0	0	0	0	0	0	035	Textile Production
	Other Operatives (N.E.C.)	1170	72	-3	69	0	69		Occup. Orientation
	SERVICE WORKERS, PRIVATE HOUSEHOLD	210	8	0	8	0	8	099	Inst. & Health Wrks.
	SERVICE WORKERS, EXCL. PVT. HOUSEHOLD	1500	105	49	154	0	154	099	Inst. & Health Wrks.
	Protective Service Workers	95	3	3	6	0	6		Public Service
373	Firemen, Fire Protection	15	0	0	0	0	0		Public Service
375	Policemen, Marshals, Sheriffs	40	1	1	2	0	2		Public Service
379	Guards, Watchmen	40	1	1	2	0	2		Public Service
311	Waiters, Cooks & Bartenders	680	74	23	97	0	97	015	Food Trades
312	Bartenders	40	1	1	2	0	2		General Education
314	Cooks	155	8	6	14	0	14	015	Foods Trade
317	Counter & Fountain Workers	80	4	3	7	0	7	097	Foods Service
311	Kitchen Workers (N.E.C.)	105	4	3	7	0	7	015	Foods Trade
	Waiters, Waitresses	300	6	4	10	0	10	097	Foods Service

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478	Other Service Workers	725	30	15	45	0	45	099	Inst. & Health Aides
329	Attendants, Hospt. & Other Inst.	65	3	2	5	0	5	074	Nurses Aide
330	Barbers	50	1	0	1	0	1	009	Cosmetology
381	Chorwomen & Cleaners	60	3	0	3	0	3	099	Inst. & Health Aides
332	Hairdressers & Cosmetologists	50	3	1	4	0	4	009	Cosmetology
382	Janitors & Sextons	120	8	1	9	0	9	006	Building Maintenance
	Practical Nurses	50	2	3	5	0	5	076	Practical Nursing
	Other Service Workers (N.E.C.)	330	10	12	22	0	22	039	Occup. Orientation
	LABORERS, EXCLUDING FARM AND MINE	775	19	-21	-2	-0	-2	039	Occup. Orientation

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A SYSTEMS APPROACH
to
VOCATIONAL TECHNICAL EDUCATION PLANNING AT THE LOCAL LEVEL

by

Cleveland L. Dennard, President
Washington Technical Institute
Washington, D. C.

presented to

The National Conference on "Methods and Strategies for State Plan Development"

Covington, Kentucky

March 26, 1969

VT009813

National Conference on
"Methods and Strategies for
State Plan Development"
Covington, Kentucky
Cleveland L. Dennard
March 26, 1969

Vocational-Technical Education Planning at the Local Level

In a discussion on major issues in Man, Education and Work, Dr. Grant Venn asserted that:

> "By its nature, that Act (VE '63) was formulated as a bank account for, as a mandate to, American education to provide new and meaningful vocational preparation for this nation's youth. Educational decisions will have to be made, decisions that will affect the future direction of the entire educational system ... The questions are, therefore, by whom and on what basis."

It appears that any realistic discussion of the theme of this National Conference on Methods and Strategies for State Plan Development is, in effect, an exercise in vocational-technical education, administrative behavior or decision making. I use the term "administrative behavior" to denote the actions engaged in by state and local directors of vocational education prior to a finalized decision that is presented as the state plan of action. It is obvious that the members of this Conference have the answer to the question of, by whom will the vocational education decisions be made. The basis of the decisions and the approach employed represents the purpose of this paper.

I am reasonably convinced that effective administrative behavior at the local level must be observable, measurable, predictable and consistent. Such characteristics when applied to an administrative planning model lend themselves to an orderly way of appraising results. Yet, during the past decade Congress has enacted a host of creative programs designed to solve our public, social and economic problems. We have made important strides forward in education, health care, pollution control and urban development, but the dimensions of our remaining problems are staggering. There are nine million substandard housing units in the United States, most of them in urban areas. Ten thousand of our nation's communities will face serious problems of air pollution. The demand for water consumption may exceed the available supply before the end of the century. Traffic jams cost the nation over five billion dollars each year. In one state alone, engineers estimate the Government documents will fill nearly 400 miles of filing cabinets by 1990.

Although education was cited only once in the previous discussion, each problem area falls within the purview of vocational-technical education to provide resources for training at the semi-skilled, skilled, technical and semi-professional levels.

It is clear that problems of this magnitude are not susceptible to the traditionally planned solutions. Figure 1 shows a traditional planning model in wide use in voc-ed planning. New methods and strategies must now be at the disposal of local voc-ed decision makers for relevant

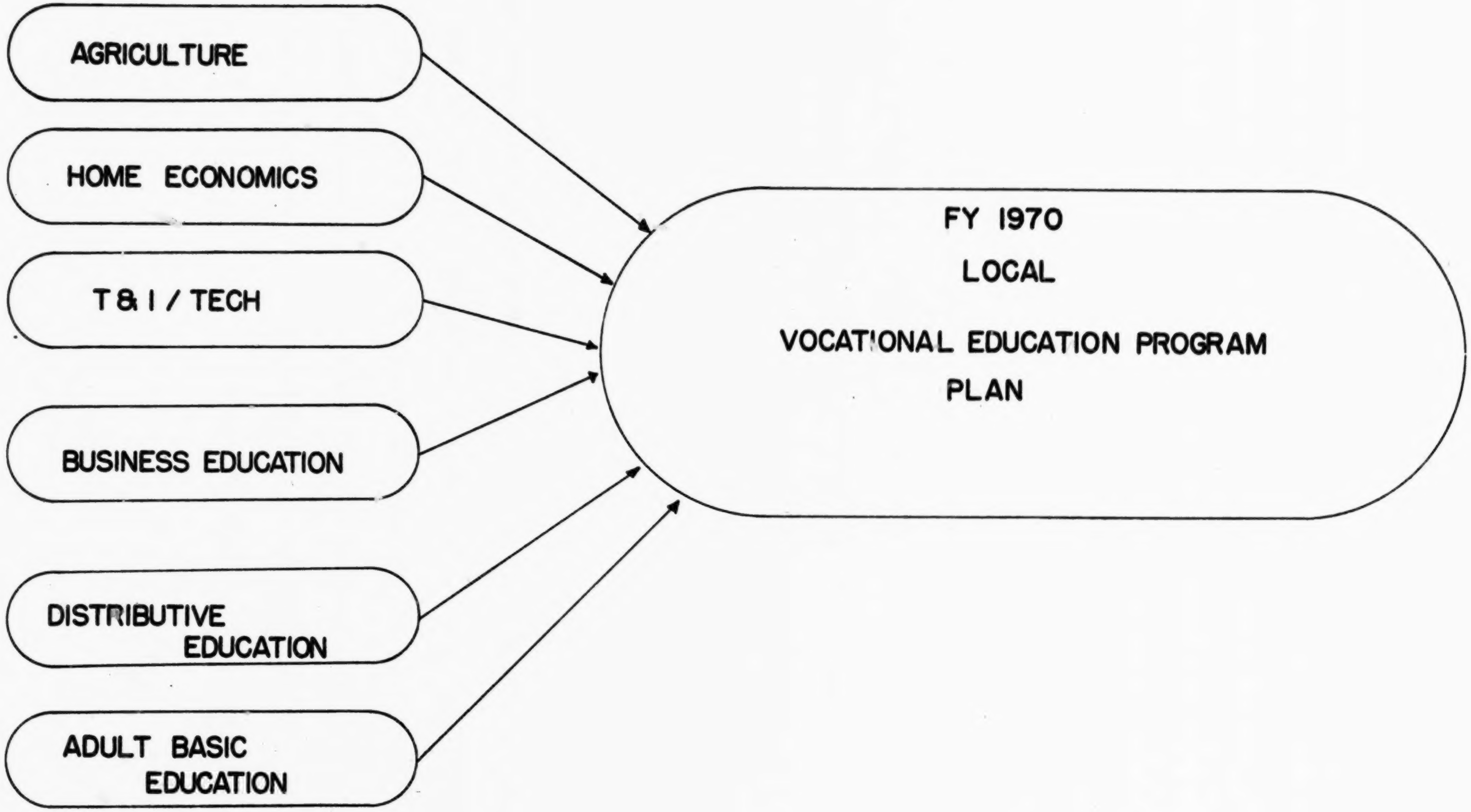

AGRICULTURE
HOME ECONOMICS
T & I / TECH
BUSINESS EDUCATION
DISTRIBUTIVE EDUCATION
ADULT BASIC EDUCATION
FY 1970
LOCAL
VOCATIONAL EDUCATION PROGRAM
PLAN

Figure 1
Traditional Inductive Planning Approach

community responsiveness. Among the new methods now firmly established in modern practical management technology is the systems approach, a technique best known for its application in the Department of Defense under former Secretary Robert S. McNamara. This is a concept of the administrator's role expressed through a set of systems and procedures called program management or planning, programming, budgeting.

The important question routinely asked in the course of implementation of a systems approach is: How much additionally would be gained or lost by way of achieving the defined objective through spending more or less for the purpose?

By way of definition, the systems approach is a unified concept for planning. The familiar processes of determining program needs, program development and of budgeting are explicitly combined. It is a system in the sense of centering on program analysis in the light of carefully delineated program objectives. It calls for program plans that can carry out these objectives and for budgetary requests that can help implement the planned programs. Further, it is a system, in that it calls for the identification of all activities that relate to the achievement of a defined objective. For example, it calls for the identification of the range of programs labeled in each of the circles in Figure 1 that are a part of achieving learning in the amount and of the type desired, even though not all of these programs are carried out by the local school system.

The graphic illustration of a systems planning model is presented in Figure 2. As a unified concept for planning, the systems model differs from the inductive traditional model in its use of both the deductive and inductive process. Essentially, the systems approach starts with a problem or premise rather than with the particulars as outlined in Figure 1.

The crystallization and labeling of the systems concept occurred in the 1950's as a result of work done by the Rand Corporation for the U. S. Air Force. Since then, the concept has been identified generally with the management of governmental activities.

During the last decade, a virtual geometric expansion in the efforts to adapt this concept in a variety of situations has occurred. The first large-scale, conscious application began in 1961 in the Department of Defense, but at about the same time, many large corporations began to formalize an analogous activity called "long-range planning." In January of 1969, well over half of the 500 largest industrial corporations in the United States have some form of corporate planning activity using a time sequence of five years or more. In August of 1965, President Johnson announced the establishment of a planning-programming-budgeting system to be used by all the civilian agencies of the Federal Government.

A very careful review of the systems approach by vocational educators will reveal that many of its elements have been in operation in Trade and Industrial education as a tool or technique for course development for many years. Verne Fryklund's "Job Analysis" and W.W. Charter's "Activity Analysis"

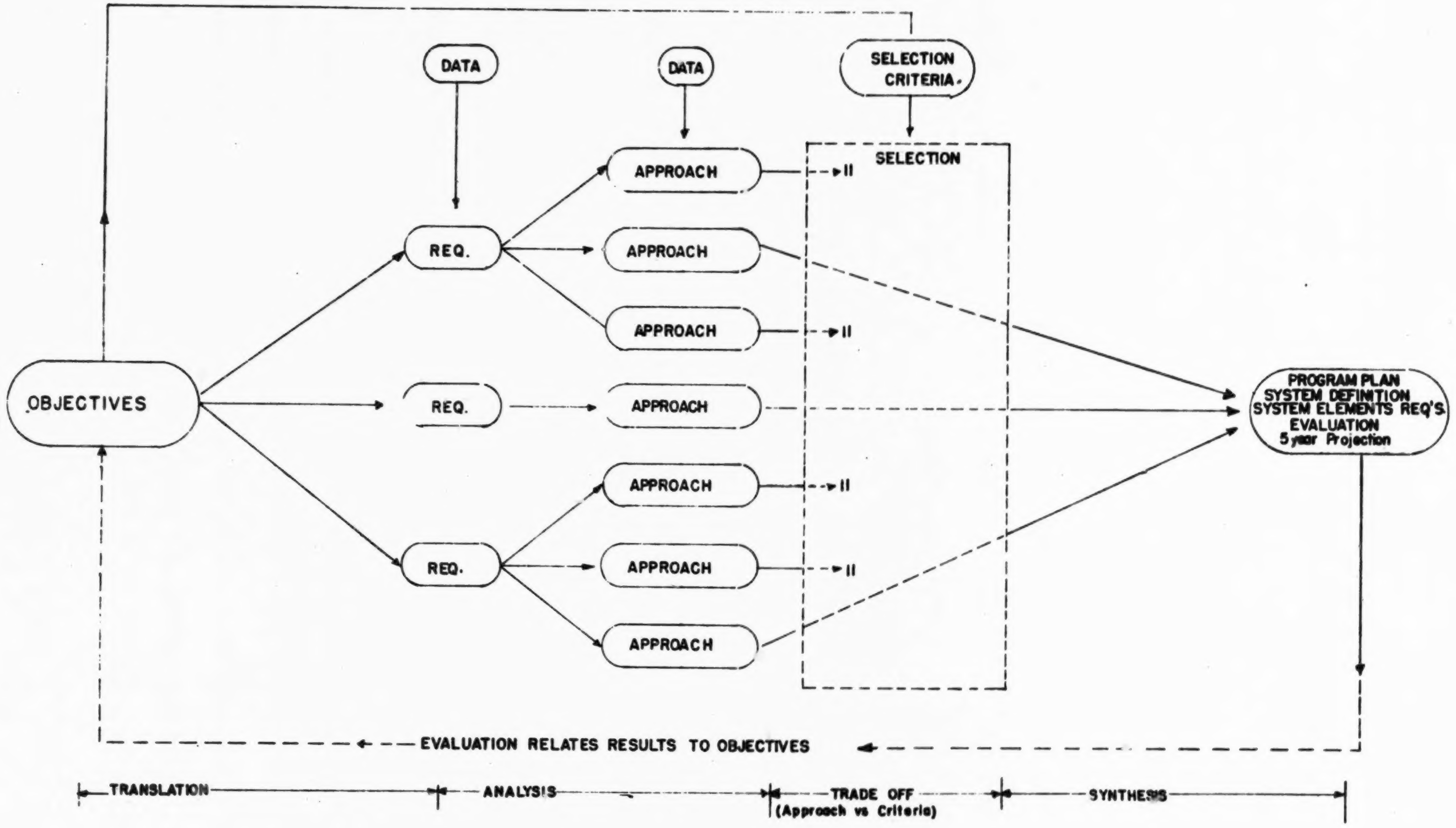

DATA
DATA
SELECTION CRITERIA
SELECTION
OBJECTIVES
REQ.
REQ.
REQ.
APPROACH
APPROACH
APPROACH
APPROACH
APPROACH
APPROACH
APPROACH
II
II
II
II
PROGRAM PLAN
SYSTEM DEFINITION
SYSTEM ELEMENTS REQ'S
EVALUATION
5 year Projection
EVALUATION RELATES RESULTS TO OBJECTIVES
TRANSLATION
ANALYSIS
TRADE OFF
(Approach vs Criteria)
SYNTHESIS

FIGURE 2
THE SYSTEM APPROACH PLANNING MODEL

that Roy Hinderman used at the Denver Opportunity School in Colorado as a basis for developing vocational units of instruction in the early 1940's are now referred to at the Pentagon as "Systems Analysis" or as "the Systems Approach" to decision making. Let me hasten to add that this statement, though true, is an oversimplification of the unified concept of planning called the systems approach. The logical sequential behavior of the systems approach is as applicable to computer simulation as it is to developing a "work breakdown structure" of a job that separates steps from key points, for the four-step teaching method. The identical process was used by Gerald Leighbody in developing the teaching methodology for vocational shop instruction.

As with all methodologies or models, the systems approach is a tool. It does not make decisions. Rather, it provides a vehicle for decision making by enabling the administrator in charge of planning to place before him all of the components of an activity, including the several alternatives, before decisions are made.

In applying the Systems Approach to vocational education planning at the local level, the following administrative actions must be taken:

1. The program structure and a statement of objectives must be developed for each area of service (i.e. Agric., H.E., T & I, etc.)
2. Program analyses (cost-effectiveness analyses) and program memoranda (justification should be clearly spelled out).

3. The development of items 1 and 2 into a multi-year program and financial plan.

I have attempted to show in Figure 3 in rather precise detail the flow of action essential for developing a program plan for Agriculture, Home Economics, Trade/Industrial/Technical, and the several services using the Systems Approach: A unified planning concept. Agricultural programming documentation should be fed into the objectives oval. The objectives for each of the program plans can then be translated into clearly specific goals, program by program. For example, one aspect of the local vocational agriculture program objective is the providing of: Farm management training and placement.

(a) Formal vocational agricultural training

9-12 Grade Secondary Level
13-14 Grade Post Secondary Level

(b) On-farm-training

(c) Occupational counseling

(d) Rural-urban employment exchange information

The analyses of the program objectives would produce fixes on how many to be trained for Farm Management and placed. Where the training will take place, whether at a school site (formally) or on a farm site (Co-op or OJT). Costing factors for the various alternative approaches are then related to the objectives which lend themselves to accountable evaluation.

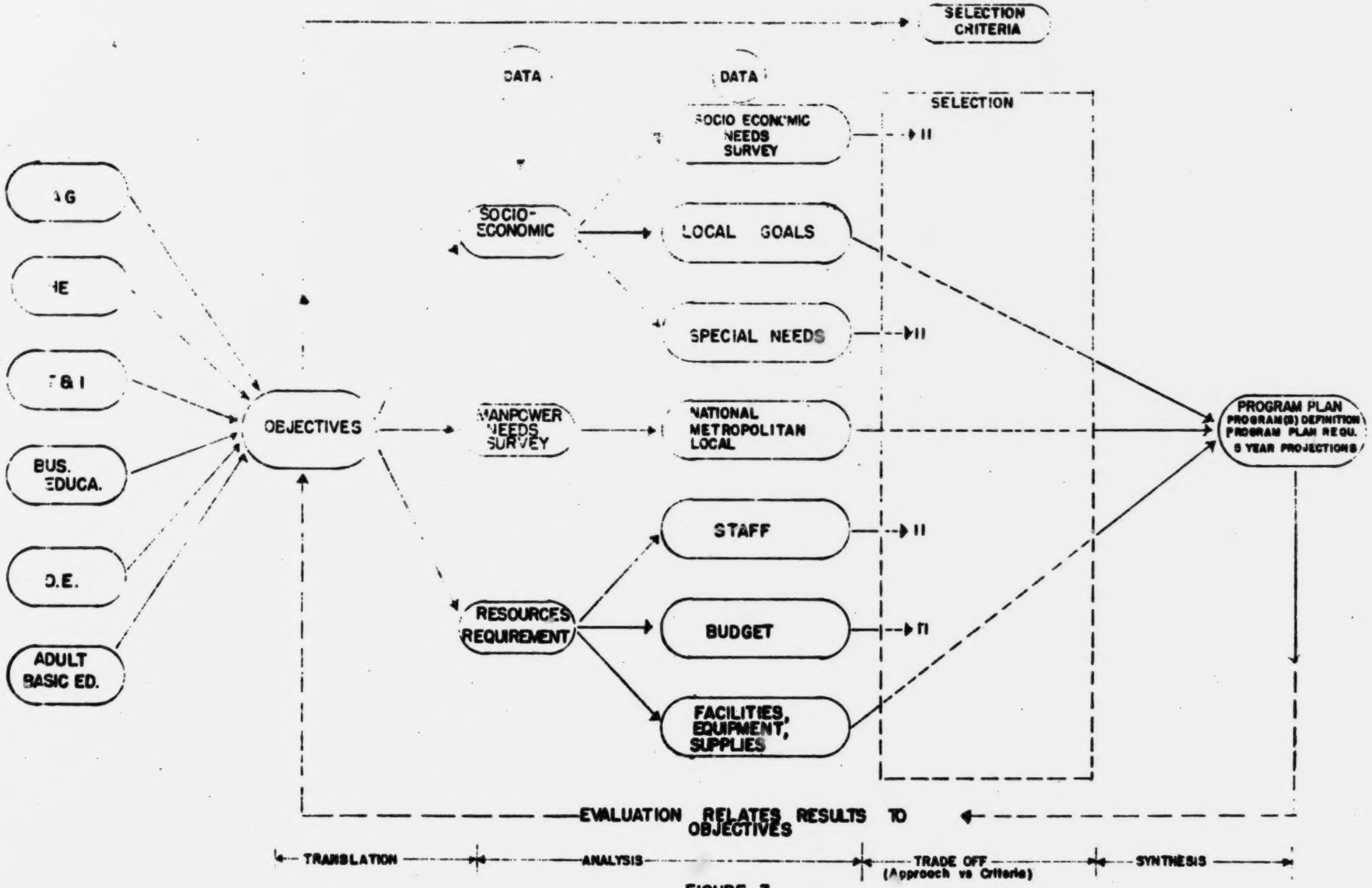

SELECTION CRITERIA
DATA
DATA
SELECTION
AG
HE
T&I
BUS. EDUCA.
D.E.
ADULT BASIC ED.
OBJECTIVES
SOCIO-ECONOMIC
MANPOWER NEEDS SURVEY
RESOURCES REQUIREMENT
SOCIO ECONOMIC NEEDS SURVEY
LOCAL GOALS
SPECIAL NEEDS
NATIONAL METROPOLITAN LOCAL
STAFF
BUDGET
FACILITIES, EQUIPMENT, SUPPLIES
PROGRAM PLAN
PROGRAM(S) DEFINITION
PROGRAM PLAN REQU.
5 YEAR PROJECTIONS
EVALUATION RELATES RESULTS TO OBJECTIVES
TRANSLATION
ANALYSIS
TRADE OFF (Approach vs Criteria)
SYNTHESIS

FIGURE 3
THE SYSTEMS APPROACH

The critical difference immediately observable in the planning process outlined in Figure 3 is the continuous analysis of alternatives for selective decision making, with the overall objective being evaluated in terms of the results to be achieved.

Secondly, the Home Economics objective must be translated into outcome terms and analyzed based on the several program alternatives available or needed to be made available in the same manner as was outlined for Agriculture. Normally, the following types of questions would need definitive answers. How many students to be taught? How shall they be taught? Type of facilities needed on-site? If a cooperative learning experience is provided -- what effect does this type of programming have on management resources requirements? What is the program selection criteria? How is the criteria used in making a program selection? What, in fact, are the trade-offs? The synthesis of each of the six program areas through the systems approach produces initially for the Local Director of vocational education a program analysis with costs and benefits in alternatives:

(a) the number of persons being trained for jobs

(b) the number and types of programs engaged in formal school training

(c) the number participating in work experience or joint school-industry training

(d) the number assisted in selecting training

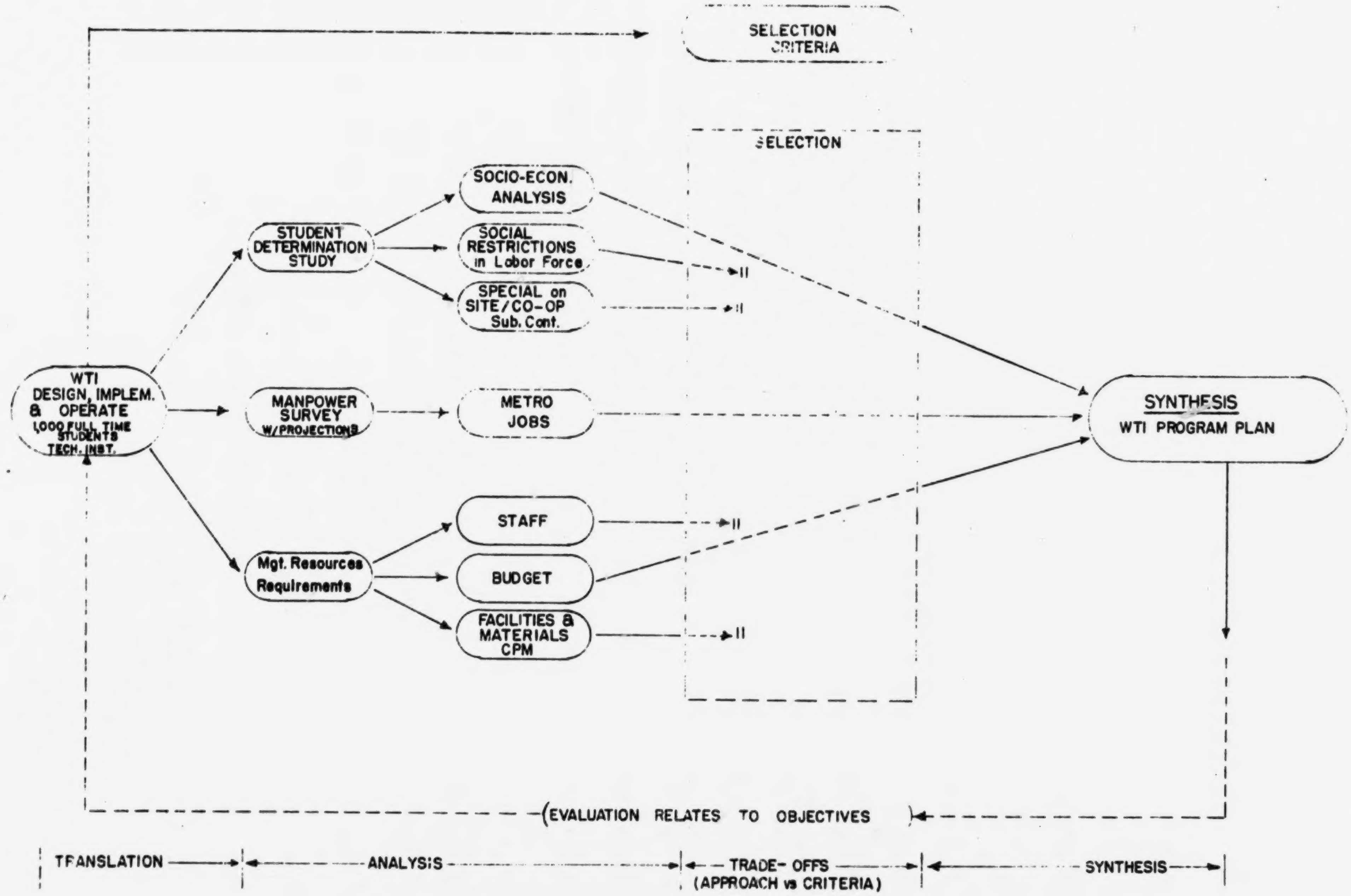
e) the number receiving employment information

f) the number employed at specified earning levels upon completion of their training.

The enactment of Public Law 89-791 by Congress in November of 1966, creating the Washington Technical Institute, provided an opportunity for the application of the systems approach to the planning of an institution on the local level that was vocational in objective and technical in its content.

Figure 4 shows the planning model used in conceptualizing, organizing and initially operating the 1,000 full-time student Washington Technical Institute in eleven months.

The District of Columbia is the nation's ninth largest city, the heart of the tenth most populous metropolitan area in the United States, (nearly 2.4 million persons). As of 1965, Washington ranked fourth in the nation in rate of growth. Unlike most other cities, the District's growth is highly stimulated by national and international crises while suffering a relative cessation of growth during periods of tranquility and prosperity on the national and international scene. As the nation's capital city, its population is greater than that of twelve states, with more students enrolled in the public schools than there are people in Little Rock, Arkansas, New Haven, Connecticut, or Berkeley, California. Although its population is double that of Atlanta, Georgia, the District has less than one-half as much land area.



SELECTION CRITERIA
SELECTION
WTI DESIGN, IMPLEM. & OPERATE 1,000 FULL TIME STUDENTS TECH. INST.
STUDENT DETERMINATION STUDY
MANPOWER SURVEY W/PROJECTIONS
Mgt. Resources Requirements
SOCIO-ECON. ANALYSIS
SOCIAL RESTRICTIONS in Labor Force
SPECIAL on SITE/CO-OP Sub. Cont.
METRO JOBS
STAFF
BUDGET
FACILITIES & MATERIALS CPM
SYNTHESIS
WTI PROGRAM PLAN
(EVALUATION RELATES TO OBJECTIVES)
TRANSLATION
ANALYSIS
TRADE-OFFS (APPROACH vs CRITERIA)
SYNTHESIS

FIGURE 4

WTI SYSTEMS APPROACH PLANNING MODEL

Basic Objectives

The Washington Technical Institute has its own governance created in the legislation. As such, the Institute was planned from scratch. The development of Board policies, administrative procedures, salary structures, retirement system and other fringe benefits were placed in a program time frame. The application of the systems approach as outlined in Figure 4 began with the statement of the problem (broad objectives). This problem was to design, implement and structure a 1,000 full-time student Technical Institute for the District of Columbia.

Translation

The translation of the objectives into analyzable components represented a major activity. Three studies were generated:

(a) Manpower Projection Study with curricular implications.

This study analyzed the public and private sector jobs market. An assessment was made of those market areas by Standard Industrial Classifications that were growing faster than the population, as fast as, and slower than the population growth rate of the metropolitan area. The curricular implications of this socio-economic analysis provided candidate course offerings in the several technologies, information management, environmental sciences, health and public service areas of the curriculum.

(b) Student Determination Study.

Clearly delineated employment patterns and opportunities generated the need for determining who desired career development training and on what basis. The post high school educational demand for career development educational opportunities in the District of Columbia was expressed as 35,000 part-time student potential and a full-time student potential of 10,000 within the decade.

The distribution of student interest against candidate curricular offerings showed a .86 correlation for the 4,100 applicants seeking the initial 1,000 student openings.

Of particular significance in the analysis of the job market data secured through the Manpower Survey was the identification of jobs that traditionally have not been filled by the population, characteristic of the District of Columbia. Well over three-fifths of the population is Black, a situation unique in American cities. Obviously, the social restrictions that exist in the labor force based on sex, age, religion, national origin and race is reflected disproportionately in the population characteristics of the job market in the District. Of the social restrictions examined, race represented the highest degree of restriction. The decision making process at this point in the analysis required a defining and redefining of the selection criteria for both, curricular offerings and students. Not being able to seriously modify the variables as structured in the data, an "open door" policy was instituted into the selection criteria.

An additional decision making input was then required, beyond the point of this planning model, that properly was a matter of institutional operating style and procedures. The analysis produced the magnitude limits of the socio-economic variables. Moreover, it pinpointed the kind of administrative awareness that a vocational education administrator must have of programming realities, without engaging in the coding of socio-economic issues in "culturally deprived" and "disadvantaged" labels.

(c) Resources Management Requirements

The third major study area was that of resources needed to subserve the vocational education process as stated in the Basic Objectives. Resources are defined as men, materials and services, categorized as staff, budgets, facilities, equipment and supplies. One aspect of the systems approach is the establishing of selection criteria for performance of required tasks in the managing of resources. We used the critical path method for scheduling and updating plans for the renovation of facilities. Having secured eight red brick, four-story buildings at the National Bureau of Standards in the lower Chevy Chase section of Northwest Washington, comprising 300,000 squared feet of floor space, we proceeded to design the temporary campus. The determining of costing factors by program activity, by curricular offering, and by staffing requirements, led to the development of a Planning-Programming-Budgeting System. The PPBS was the same application of the systems approach used in the total institutional planning. The basic difference, of course, was in developing fiscal source documents with program memoranda of justification.

Analysis

At the bottom of Figure 4, the spectrum covering analysis is essentially that phase of the systems approach involving the reduction of the multiple components and approaches into segments so that each can be examined. Questions of fact were subjected to the test of observed experience. Those aspects of the problem that involved value judgments were so identified and the basis of the judgment spelled out.

Two distinct levels of analysis took place. In cost effectiveness of construction, arithmetic processes, operations research and economics were applied through the three studies. In most of the program activities shown in the synthesis in Figure 5 relatively little, if any, technical sophistication was needed. Rather, it was a matter of pulling together already existing data in a meaningful way. This was largely a drawing upon technical and non-technical program development studies previously done that were relevant to our objectives.

Trade-Offs (Selection Criteria)

Analyses of the several alternatives identified due to an earlier cited studies required that the environmental constraints affecting the task to be performed would need criteria established that would form the basis for determining how well the possible approaches met the program objectives. The selection criteria that follows was applied to each program activity.

a) Performance
b) Cost/Effectiveness
c) Timing
d) Risk
e) Policy

TIME SEQUENCE CHART

WASHINGTON TECHNICAL INSTITUTE

THE CHART INDICATES ALL THE MAJOR ACTIVITIES THAT HAVE TO BE ACCOMPLISHED BEFORE THE OPENING OF THE RENTAL CAMPUS AND THE PLANNING OF THE FIRST PERMANENT CAMPUS. THE ADMINISTRATIVE MAN HOURS REQUIRED TO OPEN THE RENTAL CAMPUS IS ESTIMATED TO BE 22,000. THE RENTAL CAMPUS WILL OPEN SEPTEMBER, 1968 AND BE OPERATED FOR APPROXIMATELY THREE TO FIVE YEARS. THE FIRST PERMANENT CAMPUS WILL BE OPEN SEPTEMBER, 1971 OR POSSIBLY SEPTEMBER, 1970 ON AN ACCELERATED SCHEDULE. THE RENTAL CAMPUS IS PLANNED TO START WITH 800 STUDENTS STATIONS AND EXPAND TO:

YEAR -	1968	1969	1970	1971	1972	
RENTAL CAMPUS	800	1,000	2,000	2,000	2,000	
PERMANENT CAMPUS				1,000	1000	3,000
TOTAL				3,000	3,000	3,000

THE HORIZONTAL LINES ON THE CHART SHOW THE EARLIEST STARTING AND LATEST COMPLETION DATE. THE VERTICAL LINES INDICATE THE INTENSITY OF THE ACTIVITY

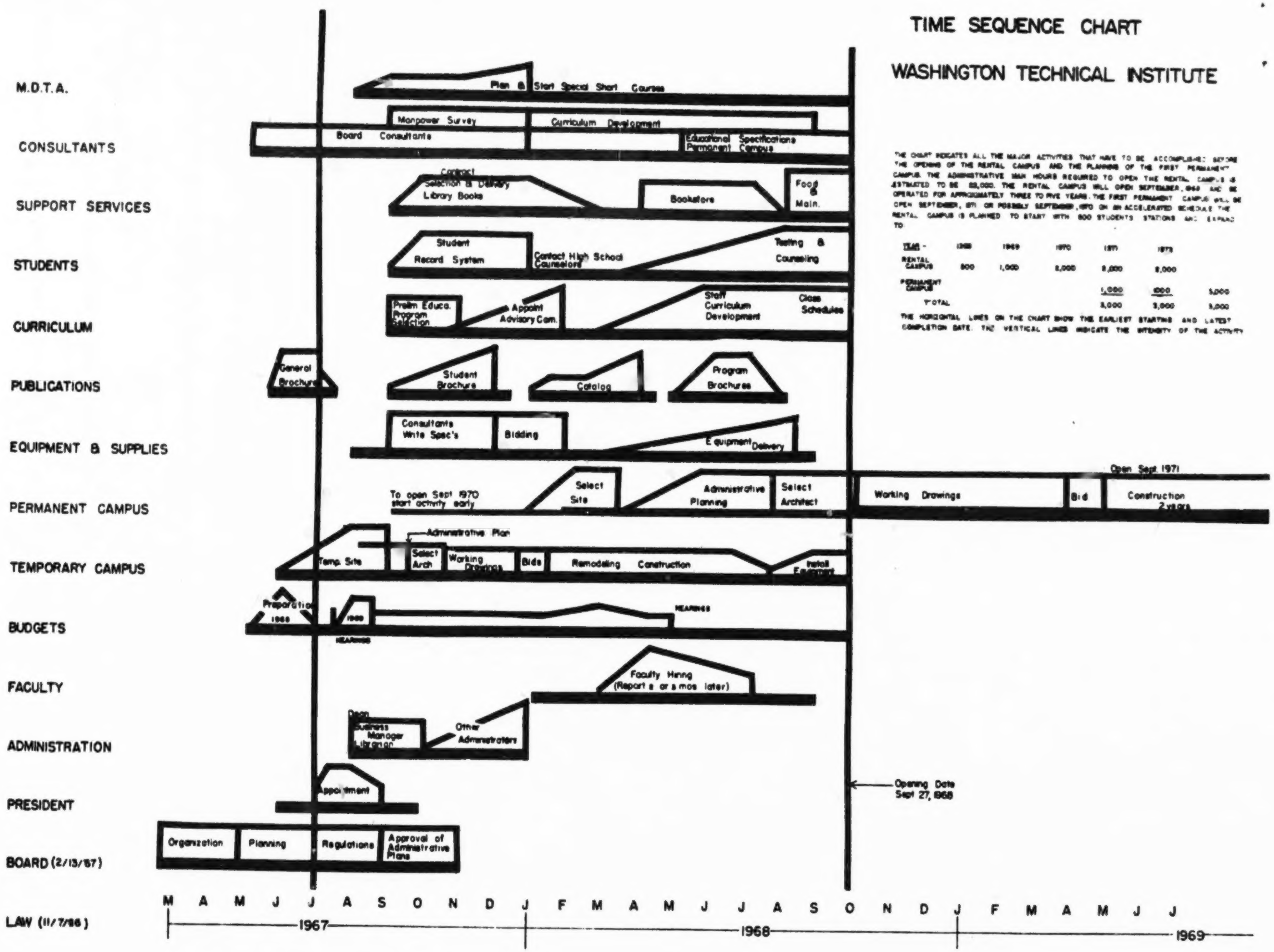


Figure 5

Each criterion was carefully examined as a "trade-off" for using one approach in preference to another.

Synthesis

The Perting (Preliminary Evaluation and Review Techniques) of each of the events and activities during the selection process led to the program distribution as shown in Figure 5. Systems approach synthesis: Washington Tech Time-Sequence-Chart.

Basic objective generated sixteen events that had to occur as program activities in order to open the Institute on September 27, 1968. Each event including the legislative enactment date was placed in a time frame. The vertical lines represented beginning and ending dates. Alphabets located at the bottom of Figure 5 represented the months of each year. Diagonal and horizontal lines opposite temporary campus, curriculum, etc. represented magnitude of effort expressed in manhours necessary to complete a task on schedule.

A separate back-up data chart was developed for each event pinpointing critical paths of activity for which slippage or missing deadlines could not be permitted to happen.

The matching of student request with curricular offerings and faculty recruitment required closer monitoring and coordinating than did the renovation schedule.

This synthesis is but one of many formats that can be used for delineating program categories and sub-categories for program implementation.

The permanent campus development line is now six months behind schedule. The securing of an urban renewal site of 24 acres is an extremely slow detailed process. Site acquisition by May 1, 1969 will necessitate a compression of architectural working drawing time to meet a September 1971 permanent campus opening date.

The identical application of the systems approach was applied to Fiscal Years 1970-75 needs in precisely the same manner as 1969 to produce a multi-year program and financial plan. As we acquire operating experience and a more realistic awareness of constraints, trade-offs will take place monthly or annually.

The Washington Technical Institute systems approach, used essentially as described here, has proven an effective tool for planning program activities. When skillfully implemented, the systems approach provides a disciplined technique for:

> Effective identification of projected requirements for complex activities.
>
> Thorough assessment of the effect of changes in environment on the development plans.
>
> Timely identification of problems and study requirements in the conceptual phase of a program.
>
> Accurate documentation tracing the chain of decisions and supporting reasons for communicating and justifying recommended courses of action.

It is reasonable to predict that the applications of this approach to multi-year planning will expand, and will provide substantiated bases for decision making relating to public vocational-technical education and to the management of program resources.

ED034856

THE ROLE OF PROFESSIONAL VOCATIONAL EDUCATION PERSONNEL IN STATE PROGRAM PLANNING AND EVALUATION

A Paper
Presented to the

Conference on Methods and Strategies for State
Plan Development in Accordance with the
Provisions of the Vocational Amendments of 1968
March 25 - 27, 1969

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Sponsored Through the
Bureau of Vocational Education
State Department of Education
Frankfort, Kentucky

VT009813

THE ROLE OF PROFESSIONAL VOCATIONAL EDUCATION PERSONNEL IN STATE PROGRAM PLANNING AND EVALUATION

INTRODUCTION

The management of change has become a central preoccupation of public education in this country. Whether we like it or not, vocational education is a segment of this enterprise.

Let us confine ourselves for the moment, however, to state agency operation. Let's assume that legislators and others have done their part and have provided us with a budget based upon the "world of tomorrow." Our governing board members inevitably begin asking the question: "Who will make it all work?" Some people resist change. Some hold the keys to it. Some admit the need for new ways but don't know how to begin. At this point, governing boards and top administrative officials seek to provide the type of management practices that unlock the talent, energy, and knowledge where they're needed, ease the inevitable pains, and help valuable professional personnel to contribute to and shape change rather than be frustrated by it.

The formula for success, in coping with the challenge of change, is elusive. Admittedly, the approach I am submitting for your consideration is only one version of many that might be considered. Hopefully it will lend itself to various operational styles and varying degrees of democratic involvement.

Some Elements of the Challenge We Face

No special attempt is made in this proposed operational pattern to set forth the overall purposes of American education. However, this approach to "planning" if followed, will cause us all to reckon with these issues.

We doubtless could all agree that many innovations and changes in general and vocational education are presently underway. Usually, I think we could also agree that they are piecemeal and patchwork efforts. They are often adaptations within a traditional education framework which may have served society quite well in the years gone by, but which is not effectively adjusting to todays' needs.

Admittedly there is a limit on how much can be done. In each of our states, I am sure, we are under pressure to streamline our operations and get more for each dollar. We are urged to get with the "systems approach" and are adding to our kit of tools operations research, cost effectiveness, cost-benefit analysis, statistical decision theory, simulation and computer techniques.

In Oregon, the hub of what we like to think of as the state's dynamic school system is the State Board of Education with responsibilities for grades K through community colleges, including vocational education. Policy decisions and leadership from the state agency should largely determine the directions education will take in Oregon in the decade ahead. I am sure our State Board members would be inclined to agree that it has been nearly impossible at times to maintain the desired leadership role ---- unfortunately other state agencies may at times be better equipped to help local educational agencies organize and operate programs. Many factors contribute to this situation, including the extent to which we are capable of utilizing sound management practices.

The nature of my assignment is such that I could perhaps propose to treat vocational education as a separate segment of the total educational program for purposes of my discussion here today. Based upon the assumption, however, that the state of Oregon desires excellent educational opportunities for its citizens, the State Board of Education has stipulated ---- and I concur ---- that such opportunities will be consistently available only when they are carefully and continuously planned as a total entity. From time to time in this presentation I will have an occasion to illustrate a point by citing an example as it might apply in Oregon ---- and when this occurs, it will be from the point of view that career development is an integral part of the total educational program.*

Even though each state's educational structure differs from that of its neighbor, I am sure we have more responsibilities and problems that are similar than that are different ---- especially when we talk about state agency planning for vocational education.

HOW DO YOU VIEW YOUR AGENCY'S EFFECTIVENESS IN RELATION TO THE JOB AHEAD?

It is not my purpose to propose a particular model for the state governance of vocational education. It is believed that what is set forth will be applicable regardless of the state's organizational structure. Also, I do not believe that it would be useful to reiterate to you knowledgeable people administrative or management principles and practices. Rather, I would at the outset propose to highlight a few strengths and weaknesses that we might find in varying degrees in our respective state agencies ---- and suggest that they may be symptomatic (perhaps even syndromes!) of our program operation. If so, we should be aware of them as we prepare for tomorrow's assignments.

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*The basic concepts of a management organizational system related to a state educational agency that are used in this presentation are to be found in the publication "A New Management Organizational System For The State Board of Education" as submitted by Dale Parnell, Superintendent of Public Instruction to the Oregon Board of Education in February, 1969. I accept responsibility for the adaptations of this system to the theme of the assignment as set forth herein. The advice and counsel of Donald M. Gilles, Director of Planning and Special Projects of the Oregon Division of Community Colleges and Vocational Education in the preparation of this paper is also gratefully acknowledged.

Strengths of our state agency

We know that some strengths exist, even acknowledging biases, otherwise our organizations would have collapsed under the strain of the changes, program growth, and the general turmoil that has prevailed in recent years. These strengths doubtless include:

1. The fact that you are identified with the development and operation of an ever-increasing amount of vocational-technical education that is meeting the needs of the people.

2. The existence of many highly qualified and dedicated professional persons who put in time and effort beyond the regular call of duty to accomplish their objectives.

3. A commitment on the part of many to get the job done even though the formal structure in which they work may not be the most conducive to accomplishing their objectives.

4. Increasing recognition that the role of competent and effective vocational educators is progressively a more vital and essential part of the total educational team as career development becomes an integral part of the mainstream of American education.

//// Are these staff accomplishments largely
in spite of "top management"? ////

Weaknesses that may exist

We all recognize, also, some of the weaknesses and limitations of our operation. I suggest here a few that I believe exist in varying degrees in many state agency operations:

1. Persons outside our agency find it difficult to get a clear consistent picture of the agency's position in many broad areas of educational concern. In other words, we may not be fulfilling the leadership role in a desirable manner.

2. The relationship of vocational education to the total educational program is not well understood by citizens in the state.

3. The "education story," and the priority needs, have not been effectively communicated to the bodies or groups which control the general direction and financial support for the educational programs concerned.

4. Responses to inquiries for fiscal, administrative, or program data are inadequate. There are both duplications and discrepancies in the data collected and used by the different units of our agencies.

5. Local educational agencies, from whom legislators get much of their information, are not sure whether the state agency is helping education or serving as a roadblock. They complain that too many people are speaking for the state agency, and that often conflicting answers are being received.

6. The executive branch of state government demonstrates a lack of confidence in our activities by its reluctance to support requested new or expanded programs.

7. External pressures are reacted to by creating new organization units rather than by establishing priorities, reallocating resources, and perhaps integrating changes into existing units.

//// Does "top management" cause these weaknesses? ////

What a management analysis may reveal

These external symptoms just cited may well be indicative of underlying deficiencies that weaken the organization and operation of the agency, and therefore limit its effectiveness. A management analysis of the agency's structure may point to weaknesses in two key cornerstones:

1. Well identified long-range educational goals from which current objectives and priorities are derived.

   If this cornerstone is weak, there is general reliance on fuzzy, diverse, and uncoordinated unit and individual objectives. An uneasy atmosphere exists in which the individual staff member's effectiveness varies with his ability for self-direction, and, as a result, employee relations and performance evaluation practices are poor.

   A weakness here may also result in a lack of agreement on the best procedures for meeting agency responsibilities. Procedures for sharing responsibilities with other operational levels, for instance, may not be appropriately developed.

2. Strong managerial leadership and coordination of planning and policy-making that involves all professional staff and all viewpoints.

   If weakness exists in this cornerstone, you will doubtless find a lack of understanding between the various units of the agency as to their respective problems, functions, and activities ---- which makes internal communication procedures ineffective.

Lack of strong leadership results in exceptions being made to any policies and procedures for standardizing record-keeping, collection and the use of data, and the dissemination of information. Such policies then become quite ineffective.

If strong leadership is lacking, effective personnel management cannot be practiced. Professional personnel will be attempting to handle nonprofessional activities. Position descriptions will be difficult to clarify and salary structures will suffer.

//// Can effective staff involvement be built on these cornerstones? ////

The absence of either of these two cornerstones of good administration will seriously hamper efficient management and the agency's control over its responsibilities. Only those of you who have practiced your profession in a state educational agency can really appreciate the tremendous pressure that funnels in on the Chief State School Officer, and, to varying degrees, on his staff ---- from individuals and groups within the general public, the various local educational agencies, faculty, parents and the thousands of students.

The plain truth of the matter is that most state educational agencies are not organized to handle this kind of traffic. As a consequence, the staff is often harried and frustrated, and the customer dissatisfied.

The immediate years ahead demand that we have an organization structure that is both stable enough to lead a dynamic educational program and flexible enough to cope with changing needs.

THE TOTAL STATE EDUCATIONAL PLAN -- ITS PRIORITIES -- AND THE PLACE OF VOCATIONAL EDUCATION IN THIS ENTERPRISE

Provisions for a Plan (Factors to Consider)

As mentioned at the outset, the essential task of modern management is to deal with change. A sound management structure should provide the means for accomplishing an organization's objectives. On the other hand, the objectives of an organization determine the nature of the management system just as the specifications for any product determine the nature of the machine that will be used to make the product.

To provide for a broad-based and balanced reckoning of the education program under state agency governance, provisions must be made to conceptualize the agency's role and reduce it to an education plan. This plan should logically include long-range high goals (aims) and the more immediate short-term (process) goals or objectives. The long-range goals are usually of such nature that once they are well identified they will remain relatively constant. The short-term goals may, on the other hand, take different forms with changing priorities to meet evolving needs --- as alternate means of accomplishing long-range goals.

//// Does conceptualizing agency's role this way
provide a better framework for staff activity? ////

It is suggested that each of these short-term goals can be divided in a meaningful way into four elements:

- Specific objective(s)
- Alternative procedures for achieving these objectives
- Responsibility and authority
- Feedback and evaluation systems to provide the basis for continuous planning.

This state educational plan should not be taken lightly. All projects and programs now in process, as well as proposed undertakings, should be tested against the plan to determine whether they are included in its purposes. What is their relative priority?

//// Can we use this process as a focal point
for meaningful staff involvement in planning? ////

Some assumptions that may need to be made:

1. That you do not have the time nor the resources at hand to develop new overall purposes for American education as you prepare for implementation of the 1968 Vocational Education Amendments.
2. That the participation of your staff in the identification of goals, priorities, and alternate means of accomplishing the desirable outcomes is highly essential. However, the participation by the majority of the staff in much of the data gathering and actual writing of the state plan for vocational education may only be a mark of inefficient use of highly specialized staff time.
3. That your primary concern this Spring is to identify priorities for immediate program emphasis and improvement, and that this priority list in no way lessens the importance of any program not on the list. (What we are really saying is that these priority programs demand immediate attention.)
4. That the most desirable approach to determining areas of program emphasis will include a consideration of vocational education needs within the context of all educational priorities at the elementary, secondary and post-secondary level ---- to the extent that this is practical. It is realized that the general structure and state governance of the various segments of education differ greatly in each state and, therefore, broad-based planning may only be feasible in varying degrees.

//// Staff participation in identifying priorities is essential!
Is implementing them another story? ////

Priorities for the Foreseeable Future

Presumably the state education plan (I am not referring to the federal vocational plan) must give emphasis to those activities that meet people at the points of their greatest needs ---- in other words, a system of priorities must be established.

These priorities could be classified in different ways. I am suggesting that they can be classified under instruction and management. In the instruction category would be those priorities concerned primarily with the teaching-learning process. Under management would be those concerned more with support services.

//// Would this approach influence staff structuring and participation? ////

Priorities for the next one to two years for a state agency responsible for grades K through the community college level, including vocational education, could be highlighted as follows as they might look in Oregon:

Instruction

- Improving and expanding vocational education
- Strengthing and improving primary education (including early childhood education)
- Extending and improving community college programs
- Improving the teaching of the 4th "R" (responsibility) in the curriculum
- Improving special education for the disadvantaged, handicapped, gifted

Management

- Reorganizing the state agency to cope with established priorities
- Improving the finance structure for local districts
- Closing the communication gap
- Improving teacher education and certification
- Establishing systematic assessment or educational auditing
- Providing for the reorganization of local and intermediate districts.

//// Once identified --- what does state staff (and State Board) do with them? ////

Here is an approach to processing priorities. They should first be defined in terms of the four essential elements previously outlined; and secondly be analyzed in terms of available resources which should include:

- Manpower available -- State agency level (including task force resources)
- Materials (other than state agency)
    - Curriculum
    - Facilities
    - Equipment
    - Other
- Money (federal, state, local, other)
- Perceived urgency
- Feasibility (political, other!)

//// Will time available and "Management Style" determine extent of staff participation? ////

ORGANIZING FOR ACTION

As an example, the short-term goal of "Improving and Expanding Vocational Education" can be discussed briefly in terms of the four elements as it might be developed in Oregon:

Specific objective

To develop flexible advancement procedures that will enable every student to move throughout his lifetime between "education" and the world of work, learning at his own rate, at times able to earn while he learns, taking his career place in the mainstream of a vigorous, viable society.

Alternative procedures for achieving the objective

1. Bring relevance to the curriculum at all levels by infusing general education with practical examples and illustrations from a future-oriented world of work.
2. Integrate general education with occupational education in the secondary schools using the career (occupational) cluster approach.
3. Provide work experience and on-the-job training opportunities based upon a "new careers" concept.

4. Establish new kinds of guidance and counseling services involving the community at large, using the career cluster idea to help students set broad cluster career goals.

5. Establish training programs for specific occupations in the community colleges.

Responsibility and authority

The job of the secondary schools is to offer preparatory career education and training; specific occupational training programs should be left to on-the-job training, apprenticeship, private vocational schools, and the community colleges.

Feedback and evaluation systems

1. Systematic followup of graduates and dropouts.

2. Close working relationships with employers who can report strengths and weaknesses of preparatory and training programs.

3. Interagency liaison and coordination to provide information on manpower needs and availability.

4. Develop vertical articulation and horizontal coordination to assure sequential opportunities for secondary and post-high school age youth and to assess effective use of resources.

//// Is the agency's management structure conducive to staff involvement in analysis? ////

As a further example, the "alternative procedure" No. 5 to "Establish Training Programs for Specific Occupations in the Community Colleges" is treated as one of the several career development priority objectives and is discussed briefly below in terms of the four elements as it might apply in Oregon:

Specific objective

Provide leadership, support, and guidance in the development of a comprehensive offering of specific job training and retraining at the post-secondary level for all of the population areas of the state.

Alternative procedures to achieving the objective

1. To the extent practical, provide comprehensive occupational education course offerings, that are flexible rather than rigid, within commuting distance of all persons who can benefit in all parts of the state.

2. Some programs of low demand and high cost cannot be offered at every institution. In providing for such offerings, consideration should be given to special state financial support which may include provisions for dormitory facilities and assistance to students seeking such education.

3. Develop a system(s) that permits students to secure training at the institution that most appropriately meets his needs. This may include an exchange of students between operating community college districts, or the financing of students to an institution from an area not included in an active community college district.

4. Develop agreements with neighboring states on student exchange, including provisions for curriculum allocations where low demand and high cost programs make such interstate cooperation desirable.

5. Coordinate the efforts of the private vocational schools with the occupational education programs of the community colleges to the mutual advantage of all concerned.

6. Utilize vocational funds in a manner that will provide program offerings in each community college which will serve the optimum number of persons, including those with special needs, in each institution's service area and encourage inter-institution cooperative effort.

7. Give special consideration to the development of institutional programs that have tangible linkage with on-the-job training, including apprenticeship, and the cost effectiveness implications. For instance, training for many specific jobs must be done on the job ---- as a responsibility primarily of the employer; however, there are some students whose greatest potential can be realized through institutional instruction.

Responsibility and authority

Responsibility for leadership, coordinative effort, support and guidance for the providing of a comprehensive program of occupational instruction on a statewide basis within the community college lies with the Oregon Board of Education. The allocation of state and federal funds appropriated for use in this program places certain responsibilities upon the State Board, including minimum records and reports.

Responsibility for the planning, development, operation and maintenance of individual programs within broad state-level guidelines, lies primarily with the local or area education district boards.

Responsibility for developing and maintaining on-the-job training programs, including apprenticeship, is a primary responsibility of business, industry, labor ---- and agencies concerned with wages, hours and working conditions, such as the State Apprenticeship Council.

Feedback and evaluation systems

1. A continuous and/or periodic followup system of graduates and dropouts should be developed for at least all on-going occupational preparatory programs.

2. The extent to which each program is developed and conducted in consultation with potential employers and others having substantive knowledge of the occupations concerned should be a factor in assuring program effectiveness.

3. The extent to which each program contributes to the improvement of an economically depressed area is a factor in program effectiveness.

4. The extent to which each program relieves unemployment in an area, the state or the region is a factor in determining program effectiveness.

5. The extent to which each program meets the needs of persons with special needs is a factor in program effectiveness.

6. The extent to which training in the occupational area concerned would lend itself (through cost effectiveness review) to institutional and formal on-the-job training; and the extent to which this was accomplished is a factor in program effectiveness.

7. The extent to which the program was jointly planned as a part of the Cooperative Area Manpower Program System may be a program effectiveness factor.

8. The extent to which this program is articulated with other occupational education programs at other educational levels (in the area or the state) may be a factor in program effectiveness.

//// How can alternatives be objectively ranked? ////

Having defined the essential elements of the priority area "Improving and Expanding Vocational Education," let us now, as an example, analyze the alternative procedures in terms of available resources and rank them for priority. Here is a "scoresheet" for this purpose as it might apply to Oregon:

SCORESHEET FOR
RANKING ALTERNATIVES

	RESOURCES					
IMPROVE & EXPAND VO-ED	Manpower	Materials	Money	Perceived Urgency	Feasibility	Total
Relevance by infusing world of work in general education	3	2	2	4	4	15
Integrate general education & vo-ed by cluster curriculum	4	3	3	5	5	20
Expand work experience & OJT	4	4	4	4	4	20
New kinds of career counseling	3	3	3	4		
Specific job training in community colleges	4	4	4			
Note: Use scale 1 - 5 with 5 highest						

//// To what extent should these rankings be a top management decision? ////

This scoresheet could also be used for the ranking of the broad priorities for a state agency. The following example could be relevant to Oregon:

RESOURCES

SCORESHEET FOR
RANKING PRIORITIES

	Manpower	Materials	Money	Perceived Urgency	Feasibility	Total
INSTRUCTION						
Vocational Education	4	4	3	5	4	20
Primary Education						
Community Colleges	4	4	3	4	4	19
Adding the 4th "R"						
Special Education						
MANAGEMENT						
Reorganizing Staff	4	4	4	5	5	22
Finance Structure						
Teacher Education & Certification	4	3	3	4		
Assessment						
Reorganizing Districts						
Note: Use scale 1 - 5 with 5 highest						

//// Aren't broad priorities consciously -- or otherwise -- ultimately ranked by "State Board" and Executive Officer? ////

APPLYING THIS APPROACH -- AND IMPLICATIONS TO FEDERAL VOCATIONAL EDUCATION STATE PLAN DEVELOPMENT

The process outlined in this paper was set forth for your consideration with such assumptions as the following in mind:

1. That this approach to staff involvement lends itself to agency use from the state board level to the smallest unit of the agency.
2. That this approach is, of course, most effective if it is utilized for the total state educational program. However, it can be used advantageously by one or more agencies where state governance is a multi-agency responsibility.
3. That this approach should provide highly essential data needed for vocational education state plan development. The potential for staff involvement, the identification of alternate procedures for accomplishing goals, the ranking of priorities, and the provision for continuous updating should assure state vocational plan content that is highly flexible and viable. (This does not imply staff involvement in the type of data gathering or state plan writing where such activity violates good principles of specialized staff utilization.)
4. That even a minimum involvement of state staff and other key people, and of agencies and organizations in using this approach should assure better understanding and commitment to the state vocational plan as it is developed.

Suggestions for implementation

If this approach to program planning, operation, and staff involvement is utilized, the following activities and outcomes should be considered by the agency officials or persons concerned:

1. The adoption of this process should result in the early identification of priority goals as well as an analysis of available resources which should provide guidelines for the statewide plan and for further use of this approach.
2. After priorities and resources have been assessed, some reassignments or restructuring of the organization may seem advisable. Person(s) and procedures to accomplish this change should be designated.
    a. Some "outside" experts, skilled in management practices may be helpful.
    b. An inventory of skill resources within the agency, in keeping with priority goals, should be made.

   c. Management information regarding various programs should be developed. This should include what is being done now, what could be deleted, and what is not being done that should be.

   d. Attention should be given to balancing the workload among the various programs and positions.

3. Provisions should be made for periodic assessment of accomplishments and for the updating of goals and priorities.

EPILOG

Some of the experts in the field of management practices take the view that management style, particularly as it relates to staff participation, should be determined not so much by the nature of the particular business operation involved -- but by the personality traits of the people themselves. They hold that there may be some tendency for certain kinds of jobs to attract certain kinds of people. They point out, for instance, that the participative approach to management may be based upon a greatly oversimplified notion about people. On the basis of some recent studies throughout the land, some of these students of management have tentatively concluded that substantially more than one-half the people in this country are not and never will be eager-beaver workers. Apparently only some variation of the old-style authoritarian administration will meet their psychological needs. Let's face it -- some of them are going to be educators!

Despite the lack of zip with which a majority of people apparently tackle their assignments, we are told that the predominant management or administrative style in most enterprises today falls about the middle of the spectrum between highly authoritative and extensive participative group action. By observing the successful managers of the more dynamic enterprises, however, you will probably conclude that a more participative approach works better.

ED034856

STATE ADVISORY COUNCILS
FOR VOCATIONAL EDUCATION

Rupert N. Evans
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Through the Vocational Education Amendments of 1968, the Congress created a new social agency in each state and charged it with the task of seeing that there was further improvement in education. This agency was named the State Advisory Council. It was given broad powers, and will be given funds to assure that it can carry out its mission. Its membership was designed to make sure that it had an independent point of view, and it was given a route to make sure that its voice would be heard. This route is through public meetings, The State Board of Vocational Education, to the National Council. At every stage, publication of findings is encouraged.

Historians will see a parallel with 1917 when State Boards and a Federal Board of Vocational Education were created. The State Boards were to be separate from State Boards of Education. The Federal Board was to give policy guidance. At first, all went well. A new dimension was added to education and the academic rigor mortis of state boards of education was combatted. With time, however, a new rigor mortis set in. In many states, the state board of education assumed control, switching hats once a year to act as a state board of vocational education. The Federal Board lost its audience and was killed.

The same dance might be repeated. State advisory councils and the National Council may wither away. Some things are different now, however, from 1917, and these differences may be crucial. First, the councils are charged with evaluating programs and publishing the results. In the early days, no one worried much about evaluation, and our tools for it were so crude we would not have known how to proceed even if people had been interested in evaluation. Second, it is now abundantly clear that society has an obligation to develop every individual to his maximum potential and that certain segments of our population are in a precarious position economically and socially through no fault of their own. Third, and perhaps most important in the immediate future is a general recognition that education is important to state development and that vocational and technical education in paritcular can have a vital role to play in attracting and keeping those types of industries which provide a desirable economic base for the state. Many governors believe that vocational and technical education is too important to leave to the educators or to the Federal Government, and many congressmen apparently agree. This shows clearly in the legislative history of the Vocational Education Amendments of 1968, particularly in the actions of the House of Representatives.

Apparently both the Senate and the House of Representatives read carefully the Essex Advisory Council recommendations which stressed the need for more effective evaluation of vocational and technical education. The two houses chose, however, to implement this recommendation in different ways. The Senate pushed hard for a strong National Advisory Council which would have power to make policy recommendations to the Commissioner of Education and to evaluate in detail what each of the states were doing in vocational and technical education. The House, on the other hand, felt that policy recommendations and evaluations should be conducted independently by each state. The process of compromise yielded a National Council which can make policy recommendations, but whose responsibilities in the field of evaluation are very largely unspecified. State Advisory Councils, however, are clearly charged with responsibilities for state evaluation along the lines suggested by the House of Representatives.

One of the most interesting conflicts came when the House proposed that state advisory councils be appointed by the governor. Chief state school officers took exception to this, arguing that vocational and technical education were after all part of education and that education was their responsibility. House members and certain governors, however, recognized that in many states the chief state school officer is responsible only for elementary and secondary school education and felt that an independent agency appointed by the governor would be more likely to include vocational and technical education in post-secondary schools and for adults. Again, a compromise resulted, with the governors winning the right to appoint state advisory councils except in those states which have a majority of their state board of vocational education elected directly by the voters. Clearly the chief state school officers were rebuffed.

It seems likely that if the state advisory councils on vocational education are successful, they will serve as a model for state commissions appointed by the governor to evaluate state employment services, state welfare agencies, state highway commissions, state aid to higher education, and many other programs that have an important impact on the state and which are supported by Federal funds spent by agencies not completely under the control of the governor. If this happens, a veritable revolution in federal-state relationships will have occurred, and it is probable that marked improvements in the delivery of service to state citizens will result.

It is a remarkable anomaly that Federal aid in a particular field (contrary to the predictions of opponents of such aid) almost invariably results in massive duplication of effort through the creation of competing agencies.

This is quite the opposite from what one would expect. It is usually feared that the Federal Government will set up a single monolithic agency charged with providing services in a uniform way in each of the states. This has rarely occurred. In education generally, and especially in the field of manpower development and training, so many different Federal agencies are involved that it becomes completely impossible for even the experts in the field to keep abreast of all the agencies which could be of assistance to a particular individual needing training or retraining. Competition among federal agencies is so keen that it appears not only impossible that a single federal agency will assume control, but also highly unlikely that the welter of duplication and conflict will ever be resolved at the federal level. Many governors, however, are convinced that this duplication of effort must be reduced and that the only way that this can be accomplished is through a state agency charged directly by the governor with the task of reducing duplication. State after state was moving in this direction even before the Vocational Amendments of 1968. This trend undoubtedly will be accelerated by the requirement that the governor (or an elected state board of education) appoint a state advisory council on vocational education with a diversified membership which fits it ideally for much broader duties.

Membership of the State Advisory Council.

Four general types of members are specified:

The first type of representation on the State Advisory Council comes from groups which are or should be served by vocational and technical education. This includes persons who know the vocational needs and problems of management and labor, one or more persons representing the state industrial and economic development agencies, one or more persons representative of the poor and disadvantaged and one or more people having additional knowledge of the educational needs of physically or mentally handicapped persons.

Second, it includes persons who are familiar with administration of state and local vocational programs, one or more persons who are knowledgeable about vocational education but who are not involved in administration of state or local programs, and one or more persons who are familiar with programs of technical and vocational education including programs in comprehensive secondary schools.

Further emphasizing the separateness of the State Advisory Council from the State Board for Vocational Education is the requirement that the State Advisory Council cannot include members of the State Board of Vocational Education or its employees. The multiple representation of the people who are closely related to the actual operation of vocational education seems to indicate that the Congress felt that groups within the state should keep a knowledgeable eye on what the state board and its staff are about. Such an attitude would certainly be consistent with provisions elsewhere in the legislation in state plans and annual programs of work being developed after widespread consultation and be readily available to all persons who wish to examine them.

A third group represents the educational agencies within which much of vocational and technical education exists. Included here are representatives of post secondary or adult education agencies or institutions. Also included are representatives of local educational agencies, one or more persons who are representative of school boards, and one or more persons representing school systems which have a heavy proportion of disadvantaged students.

Finally, in an attempt to secure at the state level the coordination which the Congress has refused to mandate at the federal level, there must be one or more persons from the comprehensive area manpower planning system of the state.

Once appointed and certified to the Commissioner of Education, the state advisory council must meet to select a chairman from its membership. Thereafter, it determines its own rules, except that it is required to hold at least one public meeting each year to provide an opportunity for full expression of views on vocational education.

Duties of the State Advisory Council.

Two types of duties are specified:

1. It should advise the state board of vocational education on policy matters relating to the development of the state plan and to the development of annual and long-range program plans.

2. It must evaluate vocational education program services and activities and publish and distribute these evaluations. The annual evaluation report will be submitted to the Commissioner of Education and to the National Council via the state board of vocational education, which may append additional comments, but must not change the content of the report.

Of these two duties, clearly the one which is most likely to be significant is the annual evaluation report. This report must evaluate the effectiveness of vocational education in terms of the annual and long-range program plans. Further, it will recommend changes in program services and activities which seem to be called for as a result of the evaluation.

All of these requirements would likely be only so much window dressing if it were not for the fact that Congress gives to each council the right to employ a staff and to contract for services needed in meeting its responsibilities. As much as 150 thousand dollars per year would be available for the activities of the state advisory council if full appropriations are provided. These funds would permit the advisory council in a typical large state to have a budget such as the following.

Executive Secretary	$20,000
Vocational Education Specialist	$18,000
Labor Economist	$18,000
Secretary and office expense	$10,000
Expense for meetings of Advisory Council	$ 4,000
Budget for contractual services (collection of data, analysis, report writing, publication)	$55,000
Total	$150,000

A council which can devote its attention to policy formation and a council staff which can concentrate on evaluation can accomplish a very great deal. Contrast this with a state board of vocational education which must continually be making administrative decisions and a state staff in vocational education which must spend a heavy proportion of its time on inspection, routine report writing, public information, and other relatively unproductive activities. The wisdom of the Congress seems evident when one considers that if the duties of evaluation and policy recommendations had been assigned to the state board and to the state board staff, inevitably, considerably less attention would have been paid to these activities because they would be submerged by day-to-day routine.

Procedures for Planning

In spite of the example set by such states as North Carolina, too many governors are still blissfully unaware that education is important to state development and that vocational and technical education in particular can have a vital role to play in attracting and keeping those types of industries which provide a desirable economic base for the state. The requirement that representatives of state agencies for industrial and economic development must serve on the state advisory council will bring together these agencies in vocational education for the first time in many states.

The comprehensive area manpower planning system for each state or for major metropolitan areas in each state represents a valiant but vain attempt to bring order out of the chaos of federal duplication of effort. CAMPS has been ineffective largely because it is composed of a federation of independent agencies which have no stake in coordinated planning. In most states the CAMPS has been heavily dominated by agencies affiliated with the U. S. Department of Labor, and the few contacts the system has had with vocational education have tended to be limited to state office personnel. Through the state advisory council, a representative of CAMPS will come in contact with personnel whose views are seldom fed into it. Increasingly, governors are planning seriously to add teeth to a system of comprehensive human resource development which will go well beyond what CAMPS has been able to do. In at least some states, the state advisory council is likely to be central to this new coordination effort.

In most states educational planning for early childhood education is conducted by one agency, planning for elementary and secondary schools is conducted by a second agency, and planning for higher education is in the hands of still a third. For some states, representation of each of these levels of education on a single council will be an innovation in itself. When one considers that representatives of local educational agencies, school boards, special education personnel, and persons knowledgeable about the needs of disadvantaged youth will also be present, the potential for broad scale educational planning becomes considerable.

Procedures for Evaluation

The annual evaluation report which must be submitted by the State Advisory Council should cover a period from approximately June 15 of one year to the same date the year following, and should be completed by approximately October 1. If the state board of vocational education could consider it and pass it on to the National Council within a month, recommendations could be made to the Congress near the beginning of its new term at the start of the calendar year.

Data for evaluation of education generally, and of vocational and technical education in particular, are very difficult to find. There is a real danger that 50 state advisory councils will demand that these data be collected in 50 different ways. It is to be hoped that the Commissioner of Education and the National Advisory Council will impose some uniformity on the collection of basic data while encouraging each state to go beyond these minimum requirements to more innovative evaluation techniques.

Minimum requirements should include collection of data on the number of manhours of training in each type of program, in addition to the current practice of making a head count of enrollees or a head count of persons who have completed the program satisfactorily. Another minimum requirement should be calculation of the percentage of the persons in each geographic subregion of the state who could profit from vocational and technical education and who are actually enrolled in programs designed to meet their needs.

Liaison should be maintained with the research coordinating unit in each state to insure that longitudinal follow-up studies of a sample of students is carried out regularly. In the collection of data, it is to be hoped that information will be obtained regarding every type of occupational education rather than just those programs funded under the Vocational Education Amendments of 1968. Intelligent evaluation or planning cannot be accomplished without information about private industry programs, private school training, non-reimbursed occupational education in the public schools, and the whole host of federally supported manpower development programs.

The Commissioner of Education is authorized by federal legislation to pay to each State Advisory Council those reasonable amounts which have been expended in the performance of its duties. The Commissioner should refuse to pay any Advisory Council for work which is so inadequate or so late as to be useless in the national evaluation effort.

Real evaluation in education is just beginning. The mandatory annual evaluations of vocational and technical education in a state should provide a rationale and a variety of techniques which will be useful in evaluating all of education. Moreover, if it appears that benefits accrue from such evaluation, adoption of evaluation for other fields of education is likely to be hastened.

Whenever there is effective evaluation, there is a potential for harm as well as for good. If harmful practices are praised and beneficial practices are damned, society will suffer. Fortunately, the requirement for public participation and public disclosure of procedures and results provides the opportunity for correction of mistakes. The entire educational community should scrutinize the evaluation efforts of state advisory councils very closely. This scrutiny may correct errors, and those who scrutinize may learn something.

Summary

Congress has created a new social agency, the state advisory council. It was deliberately created as an agency independent of the state board of education and the state vocational education board. It has the power of investigation and public recommendation, and will have enough money to do its job. It has a potential for affecting planning and evaluation of many state agencies, though its initial import will be to change vocational and technical education. Evaluation can have harmful effects if it is done improperly, so efforts of advisory councils to evaluate education should themselves be evaluated.

ED034856

METHODOLOGIES FOR CONDUCTING STATE PROGRAM EVALUATION

By

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The Center for Vocational and Technical Education
The Ohio State University

A Paper Presented at
the National Conference on Methods and Strategies
for State Plan Development in Accordance
with the Provisions of the Vocational Education Amendments
of 1968

Covington, Kentucky
March 25, 26, 27, and 27, 1969

VT009813

The purpose of this paper is to examine methodologies for conducting vocational education program evaluation. State vocational education agencies are concerned with implementing an evaluation system which can be used in the administrative mainstream as a management tool for contributing essential information for planning and redirecting state vocational education agency programmatic efforts. State vocational education leadership also recognizes the pressing need to evaluate program effectiveness and efficiency in order to meet accountability requirements set by vocational education agency governing boards, state legislatures, and the public. In addition, the vocational education community is concerned with the importance of the periodic evaluations of vocational education at the national level called for in the National Vocational Education Act and with the need to respond to the data reporting requirements of the U.S. Office of Education.

Evaluation, as a major mechanism for the ultimate improvement of instruction, has always been highly regarded by vocational education personnel. Evaluation methodologies have, therefore, been designed and implemented in the past to achieve this objective.

The evaluation methodology which has been most widely used is process evaluation which focuses upon assessing the adequacy of educational processes and organizational structures, equipment, and facilities. This type of traditional process evaluation methodology concentrates upon program standards rather than program outcomes.

This is not to deny that process oriented evaluation has a legitimate function. However, information derived from carrying out such evaluation in the absence of product or outcome information is not usually suitable for assisting vocational education agencies in the decision-making tasks relative to state vocational education agency program planning or for meeting accountability requirements. To accomplish these two aims, the use of product or outcome oriented evaluation methods is required.

State vocational education agencies and regional accrediting agencies have over the years emphasized the value of process oriented evaluation as a methodology for fostering desirable educational changes. Part of this emphasis on the value of process evaluation to bring about desirable educational changes stems from the assumption that when program processes or components meet predetermined standards of goodness, desirable program outcomes will almost inevitably ensue. This assumption is rarely put to the test.

State vocational education agencies have also used process oriented evaluation results to justify their programs, their program expenditures, and their resource requests. One reason that vocational education agencies may need to seek alternative evaluation strategies comes from external pressures and is related to the credibility of process oriented results.

Vocational education finds itself having to compete with other agencies and institutions for limited human and economic resources at both state and local levels. Decisions regarding resource allocations are being based with increasing frequency on evidences of program efficiency, program effectiveness, program relevance to changing social and economic conditions, and the degree to which agency programmatic directions reflect community, state, and federal interests and concerns.

To this end, the demand of policy making bodies has been for more information from vocational education agencies in terms of program efficiency and effectiveness. Because process evaluation usually does not provide effectiveness or efficiency indicators, it cannot be used as a viable methodology for conducting state level program evaluation.

It should be noted that some vocational education agency leadership personnel still strongly resist attempts to replace the process evaluation approach with alternative methodologies. These persons often justify their resistance by pointing out several potentially valuable by-products which are believed to result from conducting process evaluation.

One such by-product attributed to process evaluation is that it tends to bring about desirable educational changes through the interaction and involvement of those who are being evaluated. It is true that involvement may lessen resistance to change. However, those changes which do occur are most likely to occur in the direction of standards of goodness. These standards do not necessarily assure more effective or efficient educational outcomes.

Preoccupation with process standards may have undesirable outcomes. For example, rigid adherence to standards which are arbitrary may tend to stifle staff creativity in developing innovative programs and techniques. It may also lead to inflexibility in educational programming.

There are also numerous methodological difficulties associated with many of the currently employed process evaluation methods. These difficulties include insufficient attention to test standards for instrument validity and reliability, lack of attention to problems of inter-rater reliability, and lack of attention to problems associated with observational sampling of educational processes and structures.

Another evaluation method, the formulation of data banks, has had a good deal of popularity during the past decade. In this methodology, data are collected in an attempt to meet future decision-making requirements. In this approach, the data collected are assumed to be sufficiently extensive in scope that carefully thought out decision requirements need not be initially conceived or later revised.

This shotgun approach to providing decision-making information to program planners can be markedly inefficient. The prime reason for the inefficiency is the lack of systematic planning in determining exactly what data ought to be collected. Data banks organized in the hope of meeting future decision-making requirements and which are not logically organized in terms of specific decision needs may require continuous enlarging of the data base. As the data base enlarges, the problems of securing information from local sources becomes more difficult and serious information flow problems may also result.

An evaluation methodology which has greater payoff for state vocational education agency program planners is a methodology which is oriented primarily toward product or outcome measures and which is consistent with a systems approach to planning.

The product oriented evaluation method within a systems approach to planning requires that: 1) the evaluation problem be defined in terms of its purposes and expected outcomes; 2) a measurement system be formulated from the types of decision requirements which follow from the purposes for evaluation; 3) proper feedback or quality control mechanisms be provided to continuously assess the effectiveness of the information system in providing significant decision-making data; 4) an interpretive system be formulated which permits analysis and provides necessary information to decision makers in a format which will facilitate decision-making; and 5) since the evaluation system is only one segment of a total program planning system, careful attention needs to be directed to articulating the evaluation system with other levels and components of a total planning process.

The following discussion will outline the major steps in organizing and implementing a product oriented evaluation system to be used as part of a total state program planning system. For illustrative purposes, sample materials will be used from the Model to Evaluate State Programs of Vocational Education which is currently nearing the stages of completion and being developed at the Center for Vocational and Technical Education, The Ohio State University.

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1. Define Information Requirements

The first task in designing an evaluation system is to determine the purposes to which the evaluation will be put. In our case, the major purposes are to provide accountability data and information which would assist state level vocational education agency planners to determine the effectiveness of their programmatic efforts and to assist them in long range program planning.

The next task is to conceptualize how the evaluation system can be organized to accomplish these purposes within a state vocational education agency setting. Figure 1 (in the Appendix of this paper), provides a very simplified overview of the framework within which the Center's evaluation model was developed.

In this plan, the state agency formulates a set of program objectives which describe the programmatic thrusts of the state agency. For each objective a set of program goals is developed which assesses the extent to which program objectives are achieved. Samples of (preliminary) goals and objectives are found in Appendices A and B. The program goals are formulated after careful consideration is given to decision needs of the agency. Data are then formulated from the requirements posed by the program goals. Thus, data requirements are derived in a sequence from purposes, objectives, and goals. Data sources are then identified and potential information flow problems are worked through.

After data are collected, goal accomplishments are assessed in terms of the extent to which goal projections were realized.

2. Articulate the Data System with Program Planning Procedures

The next task is to examine the adequacy of the goals and the data system in the light of agency priorities, problems, and accomplishments. Since the evaluation system is conceived as a dynamic process, state agency personnel reformulate goals and data requirements in the light of existing and emerging priorities and needs. Following this reformulation, strategies are ultimately developed to achieve the reworked program goals.

The Center's model requires extensive staff involvement in the program planning process. Other approaches are possible, such as delegating program planning authority to a planning unit. In our plan, each service area or unit within the agency would contribute to the overall program plans of that agency. The service areas or units functioning as sub-systems each develop a projected plan of activities based on the results of data evaluation. The plans would then be assembled, reviewed, and adjusted to make them compatible with the state agency's overall priorities and resources. This meshing requires an analysis of internal and external obstacles to program goal accomplishment and a review of implications for staff which would derive from alternative strategies for achieving program goals.

Following a recycling of the evaluation procedures, the annual and long range projections of goals would be readjusted in the light of new accomplishments and new decision requirements and priorities.

This brief discussion of system conceptualization incorporated three requisites. First was the requirement that the evaluation system be designed for self-initiated evaluation which would contribute to decision-making involved in state level program planning. Second was the requirement that the system relate program outcomes and specific program goals as a logical basis for planning and replanning activities and programs. Third was the requirement that the evaluation system be a continually operative mechanism in order that projected plans might be continually modified in the light of continuously acquired and interpreted information.

3. Develop Information Requirements

The Center's evaluation model was conceptualized to permit states to develop their own objectives, goals, and data requirements. For the purpose of testing the usefullness of our system and in order to provide states with a good starting point, we developed objectives and goals which could be

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accepted by many states and identified data which could be secured in most states.

For each objective, a set of program goals was formulated. The program goals were designed to provide quantitative measures of the degree to which target populations were being served, the extent to which local schools assure program quality and accessibility, and the degree to which state vocational education agency units use student characteristic and manpower data in their planning.

Three general classes of data are involved in the system. These include target population characteristic data, vocational education program data, and manpower data.

The information system requires inputs from a variety of sources. Vocational education program data and student data are secured from local schools. Manpower requirement and certain classes of target population data are secured from appropriate state agencies.

The data system requires quantitative inputs rather than subjective judgments. The data system is further organized by program levels, program areas, sector (public-private), and, where applicable, by facility types, sex, grade levels, and educational planning districts. The term educational planning district refers to subdivisions within a state having economic, social, and population characteristics such that they require separate attention in terms of educational program planning.

A state determines its educational planning districts, and school districts are identified within each of the planning districts. This procedure permits data to be reviewed in terms of overall state findings, planning district findings, and local district findings. These breakdowns assist planners in selectively allocating resources and in planning or redirecting program activities.

4. Implement the Evaluation System

Following the development of an information system, the next task is to develop instruments and procedures for collecting data. Careful attention should be directed to problems of information flow from local sources to the state unit conducting the evaluation procedures. Very careful attention must be paid to the technical requirements of test or instrument construction. Instrument developers attempting to design their own instruments should pilot test their products in local schools prior to conducting large scale instrument administration.

Additional attention should be directed to formulating the minimum number of data items which will provide essential data. This will be appreciated by those who are asked to respond to the instruments. Local sources supplying data should receive feedback of the evaluation results which would be of interest and concern to them.

The evaluation system can be made more efficient by designing data collection instruments for machine processing and data analysis. Data processing will permit almost instantaneous retrieval of information and more flexibility in examining relationships between student characteristics, program processes, and student outcome measures.

With the previous considerations in mind, the Center is in the process of finalizing its evaluation model. Seven data collection instruments have been developed for use in conducting state-wide program evaluation. Four of these instruments are designed for completion by local school administrators and vocational personnel. They provide information about schools and programs. Two of the instruments are designed to secure student characteristic data, to provide a continuous monitoring of student status, and to provide student outcome data. A seventh instrument is used to secure data relative to manpower and target populations and is completed by state agency personnel.

At this point, much thanks is owed to the states of Kentucky and Colorado who are cooperating with us in the development of the model. The state staffs have been most patient and helpful in providing reality checks to our development efforts. We expect to finalize our efforts within the next several months and our results will be disseminated to all the states.

In summary, several methodologies for conducting program evaluation have been described in terms of their value for determining how well a state is moving in the implementation of its annual and long range plans and their adequacy for providing planning and accountability information. A product oriented methodology within the framework of a systems approach was suggested as a viable methodology. Traditional process evaluation and unsystematically organized data banks were considered less productive for the purposes described.

APPENDIX A

For Discussion
Purposes Only

OBJECTIVES FOR VOCATIONAL EDUCATION

Program Objectives

1. To provide vocational-technical education and training to youth and adults who will be entering the labor force and to those who seek to upgrade their occupational competencies or learn new skills.

2. To provide comprehensive curricula which relate general and vocational-technical education offerings to the vocational objectives of students.

3. To provide increased accessibility to programs of vocational-technical education to meet the needs of those to be served.

4. To provide quality instructional programs which meet the vocational aspirations of people while being compatible with employment opportunities.

5. To provide a systematic and continuous evaluation of vocational-technical education in terms of national and state interests, student benefit, and manpower requirements as a means for making decisions concerning alternative investments of human and economic resources and the redirection of program objectives.

APPENDIX B

The Center For Vocational and Technical Education
The Ohio State University
Project 20
January, 1969

For Discussion Purposes Only

THE DEVELOPMENT OF A MODEL TO EVALUATE STATE PROGRAMS OF VOCATIONAL AND TECHNICAL EDUCATION

SAMPLES OF
Objectives and Goals

OBJECTIVE 1

TO PROVIDE VOCATIONAL EDUCATION TO YOUTH AND ADULTS WHO WILL BE ENTERING THE LABOR FORCE AND TO THOSE WHO SEEK TO UPGRADE THEIR OCCUPATIONAL COMPETENCIES OR LEARN NEW SKILLS.

GOAL	
A	____ employment-bound secondary school students are enrolled in vocational education programs.
B	____ adults requiring vocational education to increase their opportunities for securing full-time employment are enrolled in vocational programs to meet their needs.
C	____ adults employed full time at a rate of pay which is below the federal minimum wage standard are enrolled in vocational education programs to meet their needs.
D	____ adults with mental or physical handicaps which act as barriers to their securing full-time employment are enrolled in vocational education programs to meet their needs.

OBJECTIVE 4

TO PROVIDE QUALITY INSTRUCTIONAL PROGRAMS WHICH MEET THE VOCATIONAL ASPIRATIONS OF PEOPLE WHILE BEING COMPATIBLE WITH EMPLOYMENT OPPORTUNITIES.

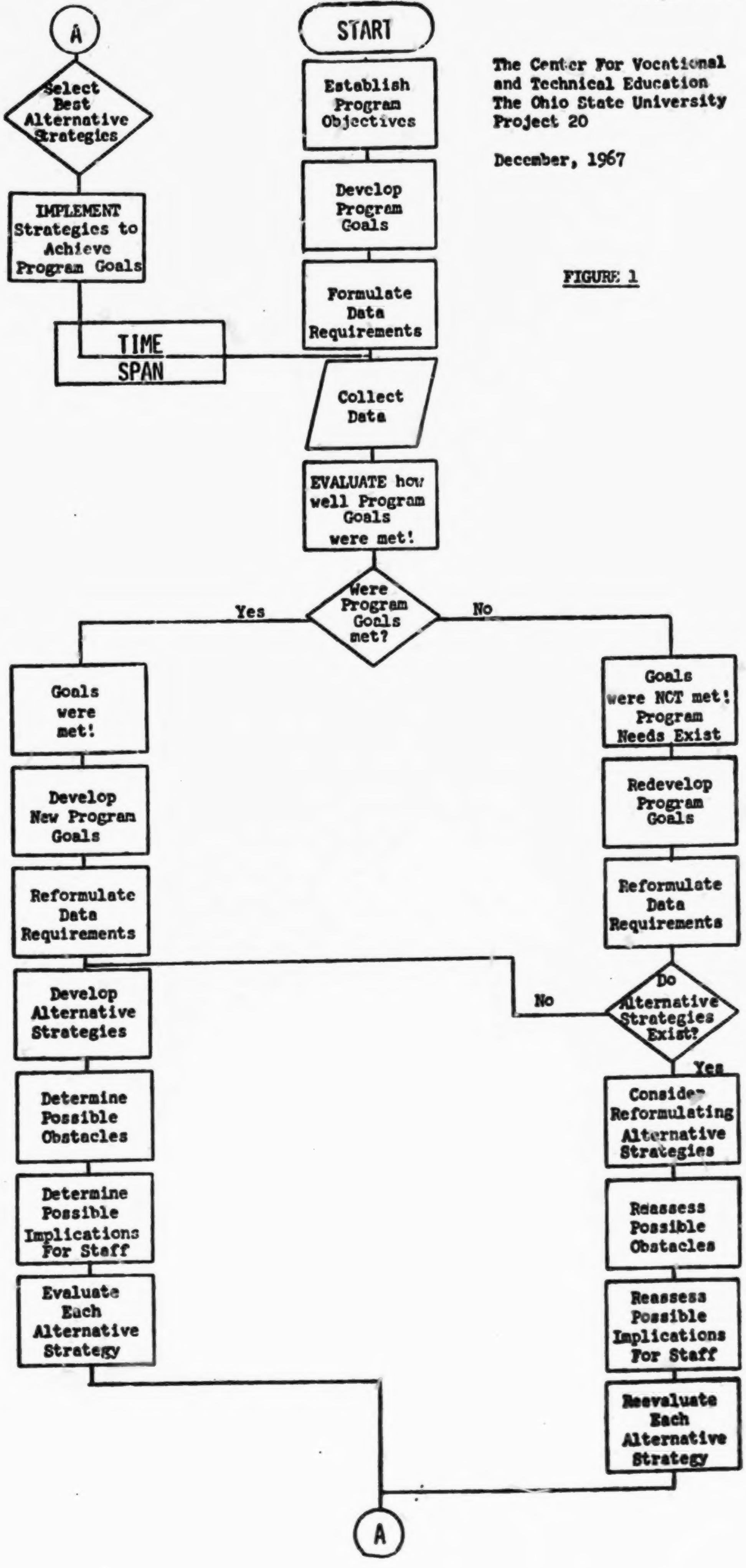
GOAL	
A	____ secondary schools provide prevocational shop or laboratory courses of instruction to acquaint students with the world of work.
B	____ secondary schools provide structured occupational information and guidance programs to acquaint students with the world of work.
C	____ vocational education programs provide part-time cooperative work experiences or simulated work experiences within the classroom setting.
D	____ vocational education programs have active advisory committees.
E	____ vocational education program completions who sought full-time employment upon completing their programs secured initial employment within the occupational areas for which they were prepared.
F	____ vocational education program dropouts who sought full-time employment upon leaving their programs secured initial employment within the occupational areas for which they were being prepared.
G	____ schools offering vocational education programs have structured placement services available to all program terminees.
H	____ vocational education programs have amortization schedules for all major equipment.

For Discussion
Purposes Only

**The Center For Vocational
and Technical Education
The Ohio State University
Project 20**

December, 1967

FIGURE 1



START
Establish Program Objectives
Develop Program Goals
Formulate Data Requirements
Collect Data
EVALUATE how well Program Goals were met!
Were Program Goals met?
Yes
No
Goals were met!
Develop New Program Goals
Reformulate Data Requirements
Develop Alternative Strategies
Determine Possible Obstacles
Determine Possible Implications For Staff
Evaluate Each Alternative Strategy
Goals were NOT met! Program Needs Exist
Redevelop Program Goals
Reformulate Data Requirements
Do Alternative Strategies Exist?
No
Yes
Consider Reformulating Alternative Strategies
Reassess Possible Obstacles
Reassess Possible Implications For Staff
Reevaluate Each Alternative Strategy
A
A
Select Best Alternative Strategies
IMPLEMENT Strategies to Achieve Program Goals
TIME SPAN

ED034856

NATIONAL CONFERENCE

METHODS AND STRATEGIES FOR STATE PLAN DEVELOPMENT IN ACCORDANCE WITH THE PROVISIONS OF THE VOCATIONAL EDUCATION AMENDMENTS OF 1968

March 24 - 27, 1969
Covington, Kentucky

SUMMARY PAPER

Presented

by

A Representative of the Staff, Bureau of Vocational Education,
State Department of Education, Frankfort, Kentucky

at

Each of the Nine Regional Conferences
Sponsored by U. S. Office of Education

VT009813

METHODS AND STRATEGIES FOR STATE PLAN DEVELOPMENT IN ACCORDANCE WITH THE PROVISIONS OF THE VOCATIONAL EDUCATION AMENDMENTS OF 1968

You are well aware of the many changes in Federal support for vocational education in this country brought about through the passage of Public Law 90-576, the Vocational Education Amendments of 1968, by the 90th Congress. The Act provides for a greatly expanded program of vocational education if and when the various authorizations are fully appropriated. It requires the states to broaden their scope of services; to be more effective in assessing their needs and in evaluating the outcomes of their efforts. It gives more responsibility and flexibility to the states in determining their vocational education needs at the state, region, and local levels and in determining the financial support of programs.

This is a complicated Act which requires new insights and broader concepts of occupational education and manpower development. It requires each state and territory which desires to receive Federal financial support to reorient, redevelop, and reorganize its present state plan for vocational education according to the new provisions and new guidelines spelled out in the Act.

The U. S. Office of Education and its regional offices have been well aware of the new demands and the complicated features of the Act. They have been very much concerned about the tremendous task of interpreting the intent of Congress, as reflected in its actions and in the provisions of the new Act. They have attempted to communicate with leaders in the various states and representatives of concerned organizations at the state and Federal levels to involve them in interpreting the provisions of the Act and in developing plans to help the states acquire the "know how", organize their forces, and orient them to the tasks of preparing a new state plan for vocational education which must be completed by July 1, 1969, if they are to receive Federal financial support.

The assessments of the U. S. Office of Education led to the decision to sponsor nine national conferences related to the significant aspects of the 1968 Act so as to generate grassroots thinking from specialists, state leaders, and others knowledgeable in these areas. The intended outcome was the production of position papers, methods or techniques, and strategies that would be helpful to the states in getting adequately oriented to the areas identified and in providing useful tools to help prepare their state plans.

The nine regional conferences were intended as a means to bring the results of the nine national conferences to the attention of representatives from the various states, and, hopefully, involve more people in a final orientation of understanding, methods or techniques, strategies and resource materials which should be helpful to them in developing their state plans and in implementing the programs provided for in the state plan.

Kentucky was asked to host one of the nine national conferences. We agreed to organize and conduct the last one which pertained to "Methods and Strategies for State Plan Development in Accordance with the Provisions of the Vocational Education Amendments of 1968." Since this conference largely dealt with the mechanics of state plan development, it was recognized that the U. S. Office of Education should have the major role in conducting the conference and in discussing methods and strategies for state plan development.

It was recognized that if the states were going to receive the assistance they needed in the implementation of the Act, at this conference we should bring together representatives of the U. S. Office of Education, representatives from the Regional Offices of HEW, State Directors of Vocational Education, and others who would be directly concerned with the development of state plans for vocational education. It was evident that the U. S. Office of Education and the regional offices want to do everything in their power to assist the states. The attendance and participation at the meeting in Covington, Kentucky, show that we were successful in attracting the people who are vitally interested in the program of vocational education and in doing what is necessary to satisfy the needs in their states, if given the opportunity. There were 221 people officially registered at our conference. They included 44 State Directors of Vocational Education; 54 State Divisions of Vocational Education Personnel; 21 representatives from State Departments of Education, including 5 Chief State School Officers; 19 people from Regional HEW offices; 3 from State Departments of Labor; 3 from State Government; 4 from community colleges; 10 from higher education; 7 from area vocational schools; 2 from State Employment Offices; 7 from State Advisory Councils; 2 from State Boards of Education; 2 local school superintendents; 1 from the Appalachian Regional Commission; 1 from the National Council on Accreditation; 1 from the National Education Association; 1 from the American Vocational Association; 4 from the Vocational Research Center; 3 from the National Advisory Council; 1 from the Pentagon; 1 from industry; 3 research consultants; 1 from the U. S. Employment Service; 4 from State Research Coordinating Units; and 23 from the Department of Health, Education, and Welfare with 17 from the Bureau of Adult, Vocational, and Library Services.

The purposes of this conference were to:

1) interpret the Vocational Education Amendments of 1968, especially those relating to the formulation of and content of state plans;

2) present and interpret the Rules and Regulations pertaining to the development of state plans under the provisions of the Vocational Education Amendments of 1968 which were prepared by the U. S. Office of Education;

3) present, discuss, and clarify the State Plan Guide for the development of a state plan for the administration of vocational education programs under provisions of the Voca-

tional Education Amendments of 1968, which was prepared by the U. S. Office of Education;

4) have presented, defended, and thoroughly discussed several working papers pertaining to the design of the state plans and procedures for preparing them.

Working with the U. S. Office of Education, we selected five key areas where we thought working papers would be helpful to the people responsible for developing state plans. The areas or topics selected were:

1) Planning at the State Level -- Long-Range and Annual Planning
2) Planning at the Local Level, including all units within the state structure expected to submit a plan and a budget for approval
3) The Role of Professional Vocational Education Personnel in State Program Planning and Evaluation
4) The Role of the State Advisory Council and Its Relation to the State Board for Vocational Education
5) Program Evaluation

On the advice and counsel from our respected consultants, we contacted people across the country to prepare the working papers. We asked these people to prepare and present the working papers:

1) Dr. Walter Arnold, Former Director of the Division of Vocational Technical Education, U.S.O.E.

   "Planning at the State Level -- Long-Range and Annual"

2) Dr. Cleveland Dennard, President of the Washington Technical Institute in Washington, D. C.

   "Planning at the Local Level"

3) Dr. William Loomis, Assistant Superintendent for Community Colleges and Vocational Education, State Department of Education, Salem, Oregon, and Former Member of the National Advisory Council on Vocational Education

"The Role of Professional Vocational Education Personnel in State Program Planning and Evaluation"

4) Dr. Rupert Evans, Dean of the College of Education and Professor of Vocational and Technical Education, University of Illinois, Urbana

"The Role of the State Advisory Council and Its Relation to the State Board for Vocational Education"

5) Dr. Harold Starr, Project Director of State Program Evaluation, The Center for Vocational and Technical Education, Ohio State University, Columbus

"Program Evaluation"

All participants at this conference will receive a copy of each of these working papers. Later these papers will be combined in a final report to the U. S. Office of Education. That report will include the reactions to the papers at the national conference in Covington,Kentucky. Time did not permit this to be done for this conference.

As a climax to the National Conference on State Plans, the U. S. Office of Education was asked to relate to all topics discussed at the conference and address themselves to the topic "Implementation of State Plan, Evaluation, and Reports." This was a very fruitful session.

Personnel in the U. S. Office of Education reviewed in detail all of the documents that they have produced for the states to use in developing their state plans. They agreed to take under advisement all questions asked by the participants that were not answered satisfactorily and needed further consideration and clarification by legal counsel and possibly the Commissioner of Education.

Every state but two was represented at the conference; therefore, you should have someone in your state that has the information presented. All of the documents will be revised and the State Directors of Vocational Education will receive up-to-date copies when they are available. If you have questions regarding the "Rules and Regulations" or the "State Plan Guide," your questions should be directed to representatives of the U. S. Office of Education or representatives from your regional office. The State Directors of Vocational Education were asked to contact Dr. Leon P. Minear and he would help them get the information requested. His telephone number is Area Code 202-962-4981, Washington, D. C.

Dr. Grant Venn set the stage for our conference by orienting the participants to the challenge for vocational education in the years ahead. He gave the charge to the conference by spelling out in clear terms the reasons why vocational education is receiving increased national attention and why leaders interested in the development of the program must accept the challenge and take full advantage of present opportunities. How well we succeed in our task will largely determine the continuing support for vocational education through the public schools which can be expected at the federal, state, and local levels. The torch is ours.

Highlights of the charge presented by Grant Venn related to the public concern about education and the growing interest in vocational education. He said there is a common concern regarding the lack of relevancy of education in schools for too many young people. Feedback from other federal funded programs; such as, the MDT and OEO, have tended to spotlight the national concern. They are recognized as a crisis response to the need for remedial programs to correct weaknesses in the regular school system.

The changing nature of work is another significant factor. We are living in a rapidly developing technological socioeconomic environment in which the labor market is demanding higher levels of occupational training for gainful employment. The fundamental rigidity of the educational system has not been able to respond to the rapidly changing needs, aspirations, and aptitudes of the people. There is a pressing demand for new directions and new alliances for the support of occupational education. It is time for educational leaders to be aware of the new challenge and new opportunities. We must be responsive and convince some people that we can do the job. There are many opportunities for leadership. There is a big need for educating people about vocational and technical education. This is true regarding the National Advisory Council, general educators, and many others. It is true regarding State Board members, members of State Advisory Councils, and many people in vocational education. It is also true at the local level. An effective program of communication and education must be developed if we are going to meet the new challenge. It can be done. This is the charge that confronts us. This is the purpose of this conference. Much good can be accomplished through your efforts to study, review, and recommend methods and strategies for the development of state plans.

I shall present a brief summary of each of the five working papers which was prepared by the consultants who presented them at the National Conference on "Methods and Strategies for State Plan Development."

1) Planning at the State Level -- Long-Range and Annual

The Vocational Education Amendments of 1968, P. L. 90-576, specify requirements in detail for annual and long-range program planning. (Section 123 (a) (4) (5) and (6). The State Board for Vocational Education is the sole agency responsible for the administration of vocational education and is therefore urged to assume broader responsibility in planning and coordinating all training programs and activities in the state. However, the U. S. Office of Education at both the headquarters and the regional offices should assume a greater role in assisting the states in the development and implementation of their plans and programs.

There is great need for the development and application of an organized, systematic planning procedure in which all educational and training agencies, public and private, can participate in the public interest. Long-range and annual plans should be integral. The state must assume the greater leadership responsibility in accomplishing this. Only in this way does it seem possible that public and private funds can be used most effectively and efficiently in meeting all of a state's manpower needs.

There are several important elements or factors in any effort to develop an effective total unified program plan of vocational and technical education:

a) Study the economic competitive posture of the state with regard to the potential for an increasing number of sufficient attractive job opportunities.

b) Identify current and projected annual trained manpower demand, state wide and locally.

c) Obtain the annual output of or supply of trained non-professional graduates (and qualified early leavers) from all training agencies and institutions in the state.

d) Analyze population and school enrollment characteristics and trends to project the potential labor force and those persons' needs.

e) Identify and consider all types of existing and proposed schools and training mediums and their existing and potential contributions.

f) Develop a program plan and cost of a wide range of occupational education resources in the form of physical facilities, equipment, teachers, and the like. All of these presume the establishment of and continuous close working relationships with other state agencies.

A systems approach based on an organized process of state-local decision-making and program formulation is needed. This kind of planning approach, primarily a deductive process, consists of the use of a problem-defining/problem-solving cycle used successively at a number of levels of plan development. It begins with a general statement of the problem, known as the objectives. The second step is to completely identify the constraints or environment of the problem. The objectives and constraints are translated into a complete statement of the problem involving interpretations and projections into the future. At this step, the objectives should be quantified into measurable goals.

After the problem has been defined, the analytical problem-solving process can begin. All of the elements or parts of the problem are identified. The relationships between the elements and their requirements are determined. A number of candidate solutions are then devised and their relative merits are rated with respect to selection criteria. This is known as a "trade-off" study or process and is used only as a guide to decision-making.

The final step in the systems approach is the synthesis of the selected system element solutions into a total system or plan. The end product of the planning cycle is then evaluated against the original objectives to determine if further planning is required.

There is a number of valuable benefits to be derived from such systematic annual and long-range program planning. Such a planning procedure:

a) Determines and justifies appropriate schools and programs required to meet established needs.

b) Helps to avoid wasteful overlapping and unnecessary duplication of effort and cost.

c) Develops close working relationships with other major governmental and industrial development agencies.

d) Assists in redirecting the state program toward meeting the priority or more critical needs of people and employers.

Evaluation becomes an inherent part of an organized systematic planning procedure. Marked changes would be required in organization and administration in order to implement the planning procedure and subsequent evaluations. New and revised financial aid policies and procedures, in terms of the new requirements of P. L. 90-576, would need to become an integral part of both planning and evaluation.

Questions and answers regarding this working paper were:

QUESTION: What is the possibility of a less sophisticated system without full detail being developed, especially in smaller program states?

ANSWER: The systems approach and application is flexible and can be modified or adapted to a particular state's problem and approach. However, any modification requiring less detail should always be made in the light of the total systems cycle. In this way increasing sophistication and more detail could be sought and obtained in the longrun.

QUESTION: How much maneuverability can be provided in preconceived annual and long-range plans to take care of rapid or sudden changes in employment?

ANSWER: Budgeting and funding policies to carry out plans, annual or long-range, could provide for unanticipated needs or emergency situations. Plans can be amended by a state any time the need arises.

QUESTION: How can the data gathering and projections be implemented in every state in view of the different relationship that exists in every state between the Employment Service and the State Board?

ANSWER: Firm and continuous working relationship needs to be established first between the two agencies. Both need to arrive at an agreement regarding what kind and form of data are needed and will be useful in program planning. Responsibilities for doing the work and funding the costs need to be fixed. The State Research Coordinating Units could assume a great share of this responsibility on a continuing basis. The systems approach can be adapted to utilize the data input.

QUESTION: How are local areas going to handle all of the responsibilities in a systems approach with comparatively inexperienced and uninformed local leadership?

ANSWER: In these cases the states will have to take on an even greater responsibility for carrying out planning. Continuous intensive inservice education in the form of state and local leadership programs and activities will have to be carried on or sophisticated planning techniques and efforts will never be accomplished.

SUMMARY:

In general, the conferees' view of the new act and the planning responsibilities of the states seemed to be broadened considerably.

There was general acceptance of the idea of an organized systematic planning procedure that would lead to a total unified program plan, annual and long-range. There was recognition of an obvious need on the part of the states to study and become more familiar with a systems approach. Considerable concern was expressed as to how adaptations of the systems approach might be made in smaller program states where personnel was limited. Strong state leadership and know-how will be required.

2) Planning at the Local Level

The increased demand for public educational services by local educational agencies is constantly rising at a phenomenal rate. Tax resources and the resources of men, materials, and facilities are clearly not unlimited. In view of the role assigned to education in meeting current economic and social problems, further escalation in educational expenditures is nationally projected.

The necessity for constant review and analysis of educational objectives, and specifically vocational technical education program objectives, requires the use of a fairly uniform systematic planning technique that will assure the allocation of program resources based on program goals and objectives that are clearly defined.

Among the new techniques now firmly established in modern practical management technology is the systems approach. As a planning model, the systems approach begins with the statement of a problem or premise rather than vocational program specifics. In applying the approach to vocational education planning at the local level, the following administrative actions are required:

a) The vocational education program structure and a statement of objectives must be developed for each service area (i.e., Ag, Home Ec, etc.)

b) Program Analyses (cost/effectiveness analyses) and program justification memoranda should be clearly delineated.

c) Program selection criteria must be established to include the criterion elements of: (1) performance, (2) cost-effectiveness, (3) timing, (4) risk, and (5) policy.

d) A synthesis of the several program objectives with their alternative approaches into a multi-year program of work must be accomplished.

When skillfully applied to vocational education program planning, the systems approach provides a disciplined technique for:

Effective identification of projected requirements for complex activities.

Thorough assessment of the effect of changes in environment on the development plans.

Timely identification of problems and study requirements in the conceptual phase of a program.

Accurate documentation tracing the chain of decisions and supporting reasons for communicating and justifying recommended courses of action.

It is reasonable to predict that the applications of this approach to multi-year planning will expand, and will provide substantiated bases for decision-making relating to public vocational technical education and to the management of program resources.

Program planning in vocational education at the local level is dependent upon base-line data from three major sources:

a) Socio-economic data developed by the U. S. Bureau of the Census.

    (1) Economic refinements of these same data by the local, state, and national Health, Education, and Welfare Departments.

b) Manpower projections that are developed by the U. S. Department of Labor, Bureau of Labor Statistics -- available through the local, state, and national Bureau of Employment Security, of the Department of Labor.

c) Resources available to the state based on federal and state legislative formula with a rationale understanding of the pro-rata share projected for the local community.

Comments by various conference participants indicated a new awareness of the use of a new technique -- the Systems Approach -- to identify each of the three sources of information. It was generally assumed that this approach would enable a local director to view all of the information before attempting to reduce the relevant aspects into a program plan.

Repeatedly, however, several rather thorny "hands-on-how-to-do-it" type problems were cited in the form of questions:

QUESTION: How can we assure cooperation among the several agencies on the local level to get the data for multi-year and annual planning?

ANSWER: The sources of base-line socioeconomic data is outlined in statistical form by the Bureau of Census. Additional population analysis reports are prepared for states, regions, and cities that can be requested specifically by the local director and reviewed to determine the educational and economic needs of the community. Often the Chamber of Commerce uses the same data and maintains program staff for analyses and projections. Most local governmental agencies will share and discuss these data when approached on a base-line source basis. The key here is identifying the information needed, and who has it, or normally uses it?

QUESTION: How do we coordinate local area plans with state and regional plans?

ANSWER: Assuming that the same planning methods are used on the local level as on the state and regional levels, the local planning data become an overlay of the same information available to the state and region. The difference being that a smaller geographic area is served. Trade-offs may often require a local community with existing facilities to provide program activities for an area outside of its geographical boundaries such as labor surplus. Such an arrangement is embodied in the area school concept. The implementation of such a concept requires that a working knowledge of the same local and state data is both available and being used by both groups.

QUESTION: How can we assure that the local district will have flexibility in planning?

ANSWER: General agreement appeared to exist on the notion that the planning model or method provided a rather precise framework for stating the local planning problem. The necessity for establishing program selection criteria based on type of performance required, amount of funds available, period of time in which program is to be implemented, and administrative policy governing implementation provides an increased degree of local flexibility.

(1) In addition to the criteria and environmental constraints, the local data cover the same elements as the state data.

(2) Local data and resources serve a smaller area.

(3) Utilizing the same planning methods reduces poor communications and frees the local staff to plan its alternatives -- courses of action consistent with the planning design.

QUESTION: How do we provide for people needs and industrial needs at the same time?

ANSWER: Most of us recognize that people needs are not separate and apart from industrial or business needs, rather the question reflects points in time. People needs of attitudes, aptitudes, underachieving, and exceptional achievement provide the basis for formal classroom shop and laboratory emphasis. Assuming that the content of courses, vocational counseling, job development, on-the-job training, placement, follow-up and use of both community and industrial advisory committees to advise on a day-to-day employment needs basis will tend to make the local implementation of a local plan effective.

3) The Role of Professional Vocational Education Personnel in State Program Planning and Evaluation

A major challenge facing state governing boards and administrative officials concerned with education today is to seek ways and means of helping professional personnel contribute to and shape change rather than be frustrated by it. The formula for success is elusive. The approach outlined here is only one of many that might be considered.

In providing for optimum staff involvement in state agency operation, it is assumed that the most effective approach will include provisions for the development of a total state educational plan with vocational education in its appropriate role. This plan should include long-range goals, short-term goals or objectives, provisions for identifying and continuously updating priorities, alternate means for accomplishing objectives, and a system of feedback and evaluation that provides a basis for continuous planning. Such a plan will necessarily take into consideration available resources, including an analysis of available manpower, materials, money, perceived urgency and feasibility. The basic concepts of the management system outlined in this paper are adapted from a recent study and publication presented to the Oregon Board of Education.

This approach to state agency operation lends itself to staff involvement from the state board level to the smallest unit of the agency. The elements of the approach (or process) are applied to the Oregon educational program for illustrative purposes. The potential of this process for staff involvement, the alternate procedures for accomplishing goals, the ranking of priorities, and the provision for continuous updating should assure state vocational plan content that is highly flexible and viable.

It is pointed out that it may be worthwhile to assess the strengths and weaknesses that exist in varying degrees in state educational agencies concerned with vocational education today. A management analysis of the agency's structure may point to weaknesses in two key cornerstones: (1) well-identified long-range goals with current objectives and priorities; and (2) strong managerial leadership and coordination of planning and policy making that involves all professional staff and all viewpoints. The use of the approach outlined in this paper should greatly alleviate agency weaknesses attributable to poor management practices, particularly those involving staff participation in program operation.

Some of the experts in the field of management practices take the view that management style, particularly as it relates to staff participation, should be determined not so much by the nature of the particular business operation involved -- but by the personality traits of the people themselves. They hold that there may be some tendency for certain kinds of jobs to attract certain kinds of people. They point out, for instance, that the participative approach to management may be based upon a greatly oversimplified notion about people. On the basis of some recent studies throughout the land, some of these students of management have tentatively concluded that substantially more than one-half the people in this country are not and never will be eager-beaver workers. Apparently only some variation of the old-style authoritarian administration will meet their psychological needs. Let's face it -- some of them are going to be educators!

Despite the lack of zip with which a majority of people apparently tackle their assignments, we are told that the predominant management or administrative style in most enterprises today falls about the middle of the spectrum between highly authoritative and extensive participative group action. By observing the successful managers of the more dynamic enterprises, however, you will probably conclude that a more participative approach works better.

Some reactions to the paper follow:

a) An increasingly sophisticated "systems" approach to program planning and evaluation of vocational education is becoming desirable, and in fact is necessary. State staff involvement in this process is necessary. An approach to such involvement is outlined in this paper.

b) Examples of this approach to staff involvement are outlined in this paper. A comprehensive application of the approach -- even as it might apply in Oregon -- is not included. If this approach is to be useful to the various states, they should look at the process or method, and not dwell on "program philosophy" included in the two or three examples.

c) The approach or process can be applied with a minimum of "gearing up" at any level of state or local staff operation.

4) The Role of the State Advisory Council and Its Relation to the State Board for Vocational Education

Through the Vocational Education Amendments of 1968, the Congress created a new social agency in each state and charged it with the task of seeing that there was further improvement in vocational education. It was given broad powers, and will be given funds to carry out its mission. Its membership was designed to make sure that it had an independent point of view, and it was given a route (through public meetings, the State Board, and the National Committee) to make sure its voice would be heard. At every stage, publication of its findings is encouraged.

It has two functions: to advise the State Board on policy matters, and to evaluate vocational education programs and activities. If it is successful, it likely will serve as a model for creation of similar groups to evaluate and recommend policy changes for each federally funded agency operating at the state level.

Each governor is concerned about overlapping and uncoordinated activities in his state. The state advisory council appears to be a good model for aiding him in delivering services more effectively.

Effective evaluation requires good data. As soon as possible, the National Committee should specify minimum data requirements and evaluation methods for each state. But each state should be encouraged to go beyond these minimums to meet its own needs and to provide models for future national evaluation.

When there is effective evaluation, there is potential for harm as well as good. If harmful practices are praised and beneficial practices are damned, society will suffer. The public and the profession alike should be alert to evaluate the evaluation of the Advisory Councils.

The discussion follows:

Several possible dangers in the work of Advisory Councils were mentioned. These included possible partisan political use of Councils and possible controversy between the Council and the State Board which could lead to loss of public confidence. Several state directors felt that they should be voting members of their State Advisory Councils. The discussion was summarized by R. D. Anderson of South Carolina, who indicated that Advisory Councils are here whether we like them or not, and it is up to state directors to develop effective ways of working with State Councils for the good of vocational education and the people to be served.

5) Program Evaluation

Several methodologies for conducting vocational education program evaluation were examined. The state vocational education agencies are concerned with implementing an evaluation system which can be used in the administrative mainstream as a management tool. It is needed to contribute essential information for planning and redirecting state vocational education agency program efforts. The pressing need for implementing program evaluation methodologies is highlighted in the National Vocational Education Act. Evaluation results are required by states for program planning and accountability purposes and as a mechanism assisting them in the development of annual and projected program plans.

Three methods were reviewed. These included the traditional process oriented type, the unsystematically organized data bank, and the product oriented evaluation. The product oriented evaluation method is consistent with the systems approach to planning.

The traditionally process oriented evaluation method was believed to be inappropriate in providing decision-making information relative to state vocational education agency program planning or for meeting accountability requirements. A number of technical problems were discussed which were related to the appropriateness of this methodology for the intended purposes.

The development of data banks has had a good deal of popularity during the past decade. This methodology was described in the paper as not being efficient. Because future decision-making requirements are not specified in the initial organization of data banks, there is the tendency for data to become increasingly larger and creating problems in terms of information flow and providing decision-making information when such information is needed.

The product oriented evaluation methodology consistent with a systems approach to program planning was stressed as having the greatest payoff for state vocational education agency program planners. Process data were not excluded from this approach. This methodology stresses effectiveness measures rather than standards of goodness.

Steps were outlined for organizing and implementing a product oriented evaluation system. Illustrative materials were employed from "The Model to Evaluate the Programs of Vocational Education" which is currently nearing completion and being developed in the Center for Vocational and Technical Education at the Ohio State University.

The major tasks in organizing and implementing a product oriented evaluation model were outlined. The major topics discussed were: (1) how to define information requirements, (2) how to articulate a data system with program planning procedures, (3) how to develop information requirements, and (4) how to implement an evaluation system.

Reactions to the paper follow:

Following the presentation, individual and group discussions were held to review the paper's content and its implications. It was generally agreed that product oriented evaluation systems needed to be used, and it was the concensus of the participants that process factors should not be entirely overlooked. It was felt by many that greater efficiency could be achieved if the National Advisory Council and the U. S. Office of Education would provide a core of evaluative data that states should retrieve from local sources.

There was some concern that implementation of effective evaluation systems might not be accomplished during this year, but the participants believed that attempts should begin now to initiate state level program evaluation.